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MAGAZINE OF BOTANY.

PAXTON'S

MAGAZINE OF BOTANY,

AND

REGISTER OF FLOWERING PLANTS.

God Almighty first planted a garden; and, indeed, it is the purest of human pleasures; it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handiworks: and a man shall ever see, that, when ages grow to civility and elegance, men come to build stately, sooner than to garden finely; as if gardening were the greater perfection.—Lord Bacon.

VOLUME THE SECOND.

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TO HER GRACE

THE DUCHESS OF SUTHERLAND,

This Second Volume

OF

THE MAGAZINE OF BOTANY

IS,

WITH THE GREATEST RESPECT, AND BY HER GRACE'S KIND PERMISSION,

MOST HUMBLY DEDICATED,

IN TESTIMONY OF

THE ENCOURAGEMENT WHICH THE SCIENCE OF BOTANY HAS RECEIVED FROM HER GRACE'S UNWEARIED PATRONAGE,

BY HER OBLIGED AND DEVOTED SERVANT,

JOSEPH PAXTON.

ADVERTISEMENT.

The increasing interest exhibited during the past year, in the introduction and culture of Flowering Plants, may in a great measure account for the very extensive sale of the MAGAZINE OF BOTANY, which, without doubt, now surpasses that of any other work of the kind in this country. From this unexpected success, the Author is led to hope that his endeavours, however humble, have in some degree met the wants and wishes of his countrymen.

The present volume, besides the culture of Plants, written after the manner of those in the first volume, contains many select lists of the most beautiful Plants for different situations and purposes; as *Climbers* for the open Air, Greenhouse, and Stove; *Orchideæ*, both Epiphytal and Terrestrial; and *Shrubs*. Also, attached to these lists, are small paragraphs, pointing out the respective peculiarities, propagation, culture, &c. &c. of each species, which, although they may be found defective by experienced Gardeners and critical Readers, yet will certainly not be without use, even to the experienced.

The Wood-cuts are numerous, and consist of illustrations of many systems of heating by hot water, in order that our Readers may try the various modes recommended, or already in use—Plans and Sections of Plant-houses of various kinds, Machines, Instruments, Utensils, Plants, &c. &c., which will be found a great assistance to all interested in Flower Gardening.

The Coloured Plates represent Plants all very valuable, some entirely new, and are executed in a superior manner.

The Author hopes that the improvements in contemplation for the third volume of the Magazine of Botany, will enhance its value still more, and that the Work will progressively improve, as its extensive sale shall render him able to carry his plans into effect.

Chatsworth,
Dec. 20, 1835.

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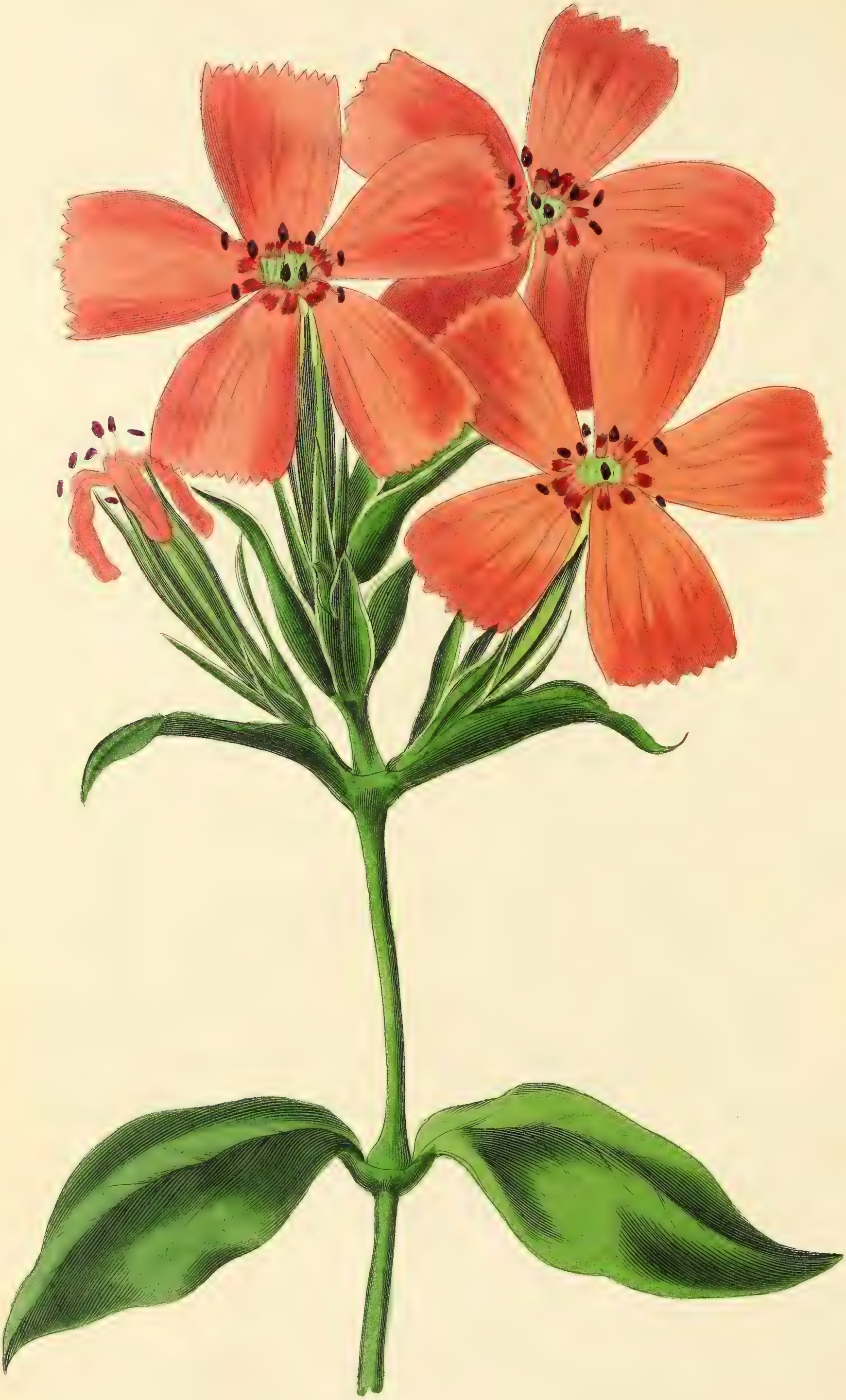

Lychnis grandiflora.

LYCHNIS GRANDIFLORA.

(GREAT-FLOWERED LYCHNIS.)

CLASS.
DECANDRIA.

ORDER.
PENTAGYNIA.

NATURAL ORDER.
CARYOPHYLLEÆ.

GENERIC CHARACTER.—*Calyx* one leaved, cylindrical, five-toothed. *Corolla* consisting of five petals, clawed. *Capsule* one to five-celled. *Seeds* roundish.

SPECIFIC CHARACTER.—*Herb* perennial, growing from one to two feet high, quite smooth. *Leaves* ovate acuminate, shining. *Flowers* one to three, terminal and springing from the axils of the leaves. *Calyx* ribbed, and somewhat club-shaped. *Petals* five, when fully expanded, two inches in diameter, much lacerated at the edges, bright orange red, very showy, and of considerable duration.

SYNONYM.—Lychnis coronata. *Lod. Bot. Cab.* 1433.

A BEAUTIFUL herbaceous plant, bearing the open air tolerably well during summer, but requires protection in the winter. We would recommend it to be grown as a greenhouse plant by all who have the convenience, because the flowers will be much finer, more numerous, and of longer continuance, than if planted out of doors.

It is a native of China and Japan, from whence it was introduced in 1770 by Dr. Fothergill.

It may be increased freely by cuttings, which should be made from the stems immediately as the flowers begin to fade. Plant them in a mixture of peat and sand, either under a hand-glass or in pots, which may be plunged in a little heat, which is the most ready way. It is also best to divide the roots every spring; this should be always done, just before they begin to grow, and if well drained and judiciously potted, they will flower very strong. The best sort of soil is peat mixed with sand and a little leaf mould.

THUNBERGIA ALATA.

(WINGED THUNBERGIA.)

CLASS.
DIDYNAMIA.

ORDER.
ANGIOSPERMIA.

NATURAL ORDER.
ACANTHACEÆ.

GENERIC CHARACTER.—*Calyx* double, outer one consisting of two heart-shaped leaflets, each having three nerves, inner one smaller, and toothed. *Corolla* consisting of one petal somewhat bell-shaped, with a limb divided into five spreading lobes.

SPECIFIC CHARACTER.—A twining shrub, *Stem* slender, covered thickly with soft white hairs. *Leaves* heartshaped, sagittate, opposite, pubescent, five nerved. *Flowers* solitary, springing from the axils of the leaves. *Calyx* double, yellow-green. *Corolla* orange-yellow, or buff; inside of the tube dark purple, giving a striking appearance to the eye.

THIS beautiful plant is a native of the island of Zanzebar, in the East Indies, whence seeds were received by the late Mr. Barclay, of Bury Hill, in 1823, and in whose splendid collection it flowered for the first time in this country.

It is a stove climbing plant, where it grows and flowers with the greatest luxuriance, a single plant covering a space of four feet broad by ten feet high, and when in full bloom it makes a gay appearance, the dark purple visible at the mouth of the tube, forming so conspicuous a contrast with the delicate buff colour of the expanded limb of the corolla.

The best soil is light sandy loam and peat, mixed with a small portion of well rotted dung or leaf-mould. It is easily propagated by cuttings, which should be taken off when half ripened; plant in pots of light soil mixed with sand, and plunge in a little heat.

Plants raised from seeds are preferable, when seed can be obtained, for they grow stronger, and survive the winter better than those raised from cuttings.

Water sparingly in the winter and spring months, until they begin to push vigorously.

The plants should be regularly syringed over the leaves to check the red spider, to which they are very subject. Water heated to about 120 degrees Fahr. will kill them with greater certainty than when cold.

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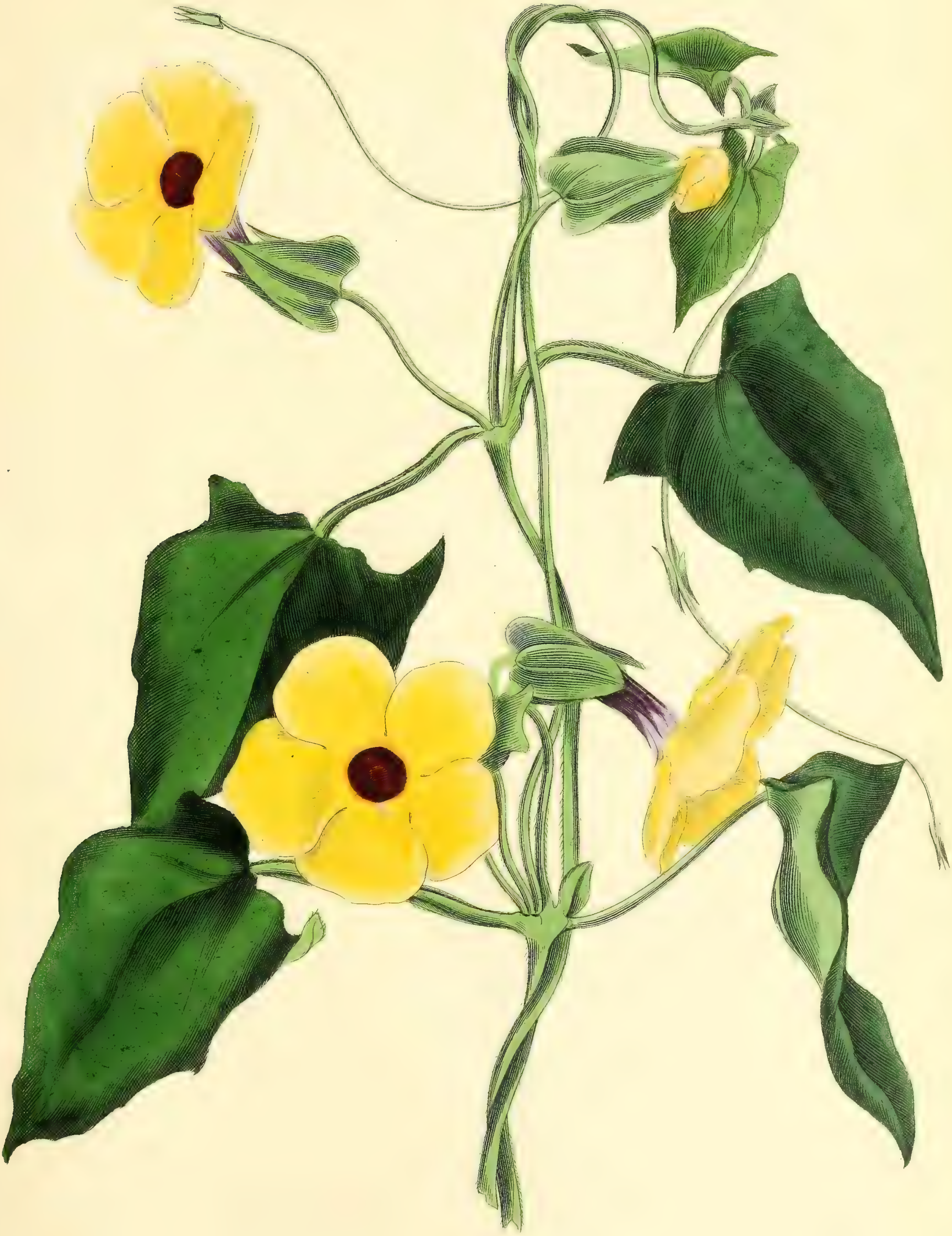

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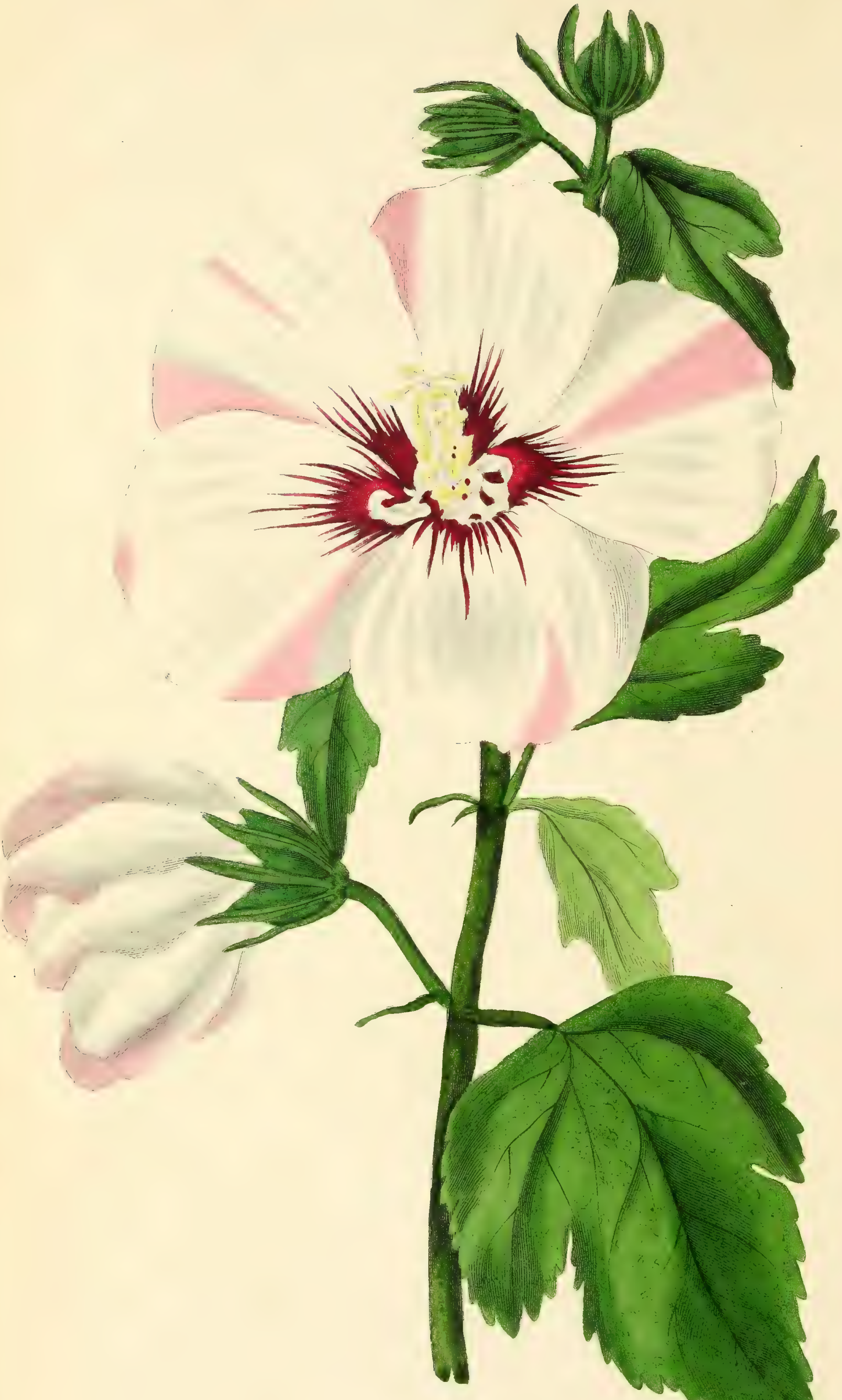
Thunbergia alata.



Hibiscus Syriacus variegatus

HIBISCUS SYRIACUS VARIEGATUS.

(VARIEGATED-FLOWERED SYRIAN HIBISCUS.)

CLASS.
MONADELPHIA.

ORDER.
POLYANDRIA.

NATURAL ORDER.
MALVACEÆ.

GENERIC CHARACTER.—*Calyx* double, outer one with many leaves. *Stigmas* five.

SPECIFIC CHARACTER.—*Stem* shrubby, from six to eight feet high, smooth green whilst young, light brown when old. *Leaves* deciduous, wedge-shaped, three-lobed, and three-nerved, irregularly toothed. *Leaf-stalks* about half an inch long. *Flowers* large, either single or double.

VARIEGATED VARIETY.—*Corolla* spreading, four inches broad, delicate white, beautifully striped with rich rose colour, base of each petal blotched and streaked with deep carmine.

THIS is a very handsome variety of the Althæa frutex; the mode of culture is noticed in vol. i. page 78; a few additional remarks may, however, be made here.

1. Plant the cuttings when the wood is nearly ripe in the autumn, in light sandy soil, and cover them with a hand-glass. The best situation is on a somewhat shaded border, under an east or western wall, in preference to a south aspect. Shelter from the severity of winter, and in spring the cuttings will grow freely.

2. Sow the seed early in spring, either under a hand-glass or on a warm border; when large enough transplant, and treat them as other hardy shrubs.

3. Grafting may be performed in February and March, but should not be done later.

SINNINGIA GUTTATA.

(SPOTTED-FLOWERED SINNINGIA.)

CLASS.	ORDER.
DIDYNAMIA.	ANGIOSPERMIA.

NATURAL ORDER.

GESNERIEÆ.

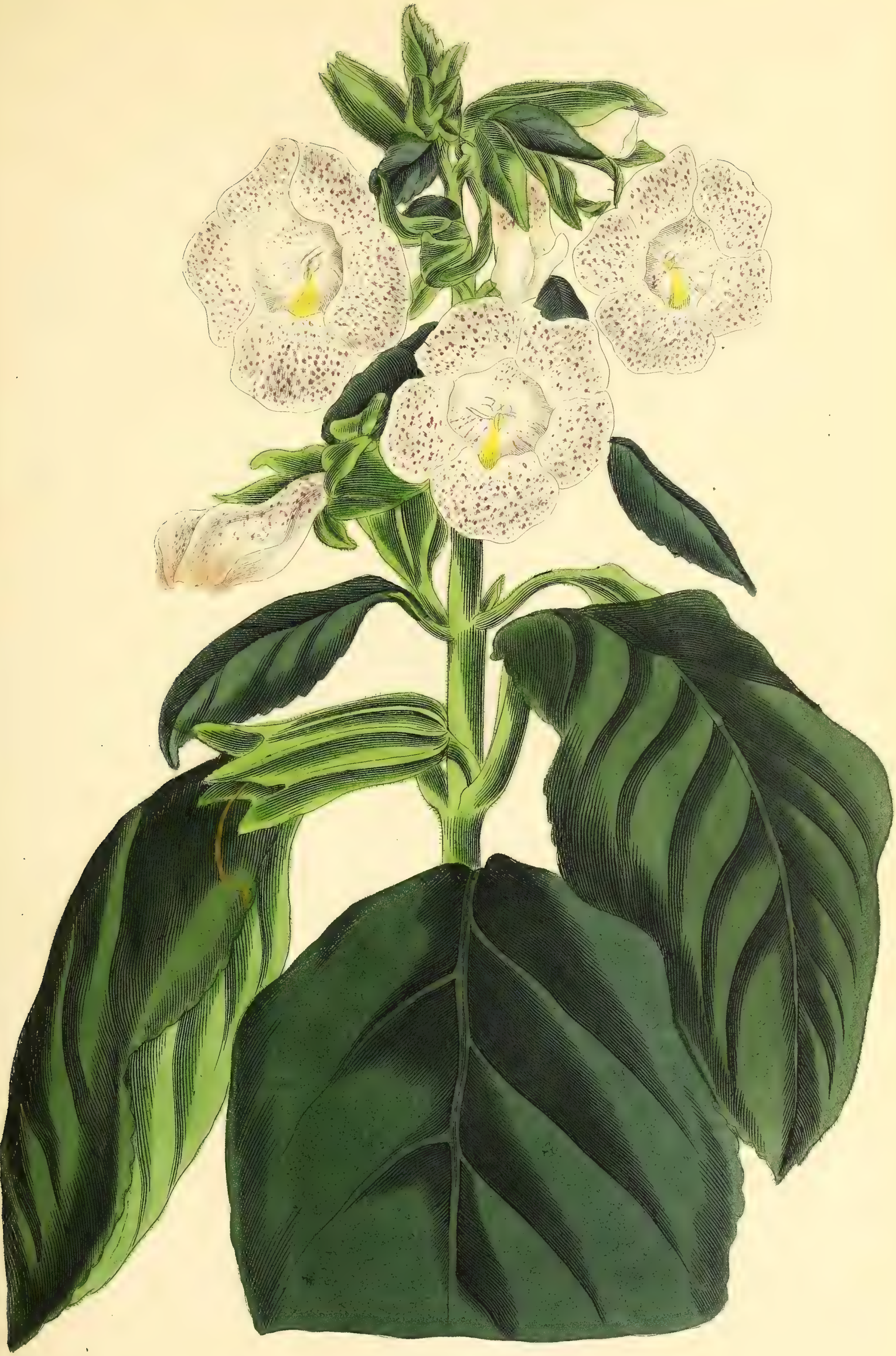
GENERIC CHARACTER.—*Calyx* tubular, five-angled; limb five-clefted. *Corolla* funnel-shaped. *Germen* five-winged, one-celled.

SPECIFIC CHARACTER.—*Stem* thick and fleshy, of a dull purple colour. *Leaves* opposite, oblong-lanceolate, serrated, dark green, very shining, covered with soft hairs. *Leaf-stalks* tinged with purple. *Calyx* light yellowish green, hairy. *Corolla* double the length of calyx, nearly white, thickly spotted with dark crimson spots.

THIS beautiful stove plant is a native of Brazil. It was introduced to the garden of the Horticultural Society of London in 1826, by Henry Chamberlain, Esq. It is not unsually grown in a dry stove, but we find it to flourish much better when placed in the hottest part of a damp stove, and supplied plentifully with water whilst growing.

It is propagated without difficulty, by cuttings or by leaves, as *gloxinias*.

The soil should be sandy peat and light loam.



F.W. Smith. del et sc.

Sinningie guttata

CULTURE OF THE GENUS RESEDA.

There are twenty species of Reseda known to botanists, of which probably half are not worth cultivation; some are ornamental, and others delightfully fragrant. The dyers' weed (*Reseda luteola*) is much cultivated for its colouring properties. "It affords a beautiful yellow dye for cottons, woollen, silk, and linen. Blue cloths are dipped in a decoction of it in order to become green. The yellow colour of the paint called Dutch-pink is obtained from this plant. The entire plant when it is about flowering is pulled up for the use of the dyers, who employ it both fresh and dried.

"The seeds are usually sown after barley is taken off the ground in autumn, or it is very commonly sown with barley in the spring; but the first mode is the best, because the plants make some progress the first year, and in the following season they will be twice the size of those sown in the spring.

"After the ground has been well ploughed and harrowed, the seeds should be sown broadcast, of which one gallon is sufficient for an acre. Unless the ground be very poor, it will not require any dung. The best crops, however, will be the result of drilling and cultivating the crop alone. The drills may be a foot apart, and the plants six inches distance, in the rows. The plants should be kept clear of weeds by hoeing.

"When seeds are required, a small portion should be left standing for the purpose, and the plants should be pulled up as the seeds ripen. The whole crop may be cleared off before the time of sowing wheat, which is the best crop to follow dyers' weed.

"The crop is taken by pulling the entire plant; some pull it when in flower, others pull it earlier; the last appears to be the best. In the execution of the work, the plants are drawn up by the roots in small handfuls, and set up to dry, after being tied with one of the stalks; sometimes, however, they become sufficiently dry without being set up, by turning. These, after they have been completely dried, are tied up into bundles and sold by the name of Weld-cord.

"The demand for it is sometimes very little, while at others it is so great as to raise the price to a high degree.

"The herb is sometimes gathered green, and treated like woad or indigo; but in general the dried herb is used by the dyers in a state of decoction. The chief disease of weld is the mildew, to which it is very liable when young; and this is one reason why it is often sown with other crops *."

The Mignonette.—(*Reseda odorata*).—This sweet-scented flower is a native of Africa, and although it is regularly grown as an annual, it will survive the winter if kept in the greenhouse, and flower again with great freedom in the spring if it be not allowed to seed.

---

* Don's Miller's Dictionary.

When grown in the open borders, the seeds merely require sowing as recommended for hardy annuals in general, vol. i. p. 18; but if grown in pots to place in the house, the following directions may be necessary :—

1. *Times of Sowing.*—With regard to this, all depends upon the time it is wished to have it in flower. If for blooming in January and February, the seed should be sown in the third week in August; if to flower in March and April, sow the first week in September; if for May and June, sow in February; if for July, August, and September, sow the first in April; if for October, November, and December, sow the last week in July.

2. These five sowings require somewhat different treatment, according to the season when each sowing is made.

3. *August and September Sowings.*—The two sowings for early flowering require considerable care, or they are liable to perish by mildew.

4. The pots in which the seeds are sown should be plunged or placed in a frame, on a slight hotbed a foot and a half high, made of leaves or anything that will give a gentle heat for a short time.

5. Give the frame a good elevation at the back; fix it on a south aspect, and place the pots not more than a foot from the glass.

6. Fill the pots with a mixture of three-fourths of light maiden loam, taken from the top spit of a pasture field, and one-fourth clean sand.

7. Always give a good drainage, for any deficiency in this will invariably injure, if not destroy the crop.

8. Keep the frame close shut down until the plants begin to make their appearance, then gradually expose them to the air, in fine weather, and as they advance in growth, allow them as much air as possible when the weather is not frosty, but carefully cover them with mats at night when the weather is severe.

9. When the plants are half an inch high, thin them out, leaving eight or ten only in each pot.

10. Water with caution, and never suffer them to be exposed to rain, but allow the soil to become quite dry before any water be given, and then give it sparingly, always selecting a fine day for the purpose, that the plants may have the benefit of a little air afterwards to dry their leaves.

11. When about an inch and a half high, stop the leading shoot of each plant, to induce them to throw out side branches.

12. *February Sowing.*—These pots must be placed in a frame, as recommended for the last; but they do not require so much caution with regard to watering, &c., because they derive more benefit from the sun than those sown in autumn; and if plenty of air be admitted in fine weather, and they are safely preserved from frost, there is little danger of them perishing. These may also be exposed occasionally to gentle showers after the plants are an inch high.

13. *April Sowing.*—The seeds sown now require still less care than the last; the pots need not be placed in a frame, but on any warm sheltered border, where they will merely require the common care of hardy annuals.

14. *July Sowing.*—To be successful in this sowing, plunge the pots up to the rim in the ground; this prevents the soil from becoming over-dry, or the roots from being injured by the excessive heat of the weather.

15. Towards the end of September or beginning of October, the pots must be taken up and placed in a frame, and from thence to the situations where they are intended to flower.

16. *Sizes of Pots.*—The proper sized pots for all the sowings are upright 48's.

17. *Water* always with care, except when the plants are in flower, at which time they require a good supply.

18. TREE MIGNONETTE.—(*R. odorata frutescens*).—This plant does not appear to be a distinct variety, for the common mignonette, kept in the greenhouse and properly trained, becomes half shrubby, and in every other respect, as far as our observations have gone, is without any character by which it may be distinguished from the *frutescens*. Our plants at Chatsworth are two feet or more high on the stem, and at the top form a good bushy head.

19. Sow seeds of the common mignonette in March, or make use of some of the plants of the February sowing.

20. The pots most suitable for sowing the seed, to form the tree mignonette, are upright 32's, which are about five inches wide at top, and about six inches deep.

21. Place the pots in a melon or cucumber frame where there is a good moist heat, carefully admitting air to them as soon as they are up.

22. When they have made about four leaves, or are nearly an inch high, thin out all the plants except two, one of which must be afterwards pulled up; but it is better to leave them both growing until the danger of damping off is over.

23. As each plant advances in growth, pick off all the side shoots, leaving the leaf at the base of each shoot to assist in the growth of the plant.

24. When the plants are drawn up, by plenty of heat and moisture, to the height of about a foot, they will begin to show flower; the flowers, however, must be nipped off, and all side shoots be removed as they appear.

25. About a week after the flowers have been nipped off, remove the plants to the greenhouse, where they should have less water but plenty of air. Carefully tie each to a thin stick with bass matting.

26. After a time each will begin to send out another shoot from near the top, which must be led up the stick, and all side shoots again nipped off, but the bottom leaves again left to assist the growth of the stem.

27. The plants will now have attained to their proper height, from eighteen inches to two feet high; again cut off the bloom when it appears, and continue to keep the plants in the greenhouse.

28. In autumn they will put forth plenty of shoots from the top, and make a handsome bush, and will come into flower early in February, or March, according to the heat in which they may have been kept.

All the other annual species of Reseda, as *linifolia, Chinensis, Mediterranea,* &c., merely require to be sown in the open ground, and treated as other annuals—Vol. i. page 18.

The biennial species, as *alba, lutea,* &c., may be treated as recommended,—Vol. i. page 66.

The shrubby species are all tender plants, and although they will flower very freely in the open air during summer, it is indispensible that they be sheltered in winter, either in a greenhouse or frame. They are readily increased by cuttings of the half-ripened wood, planted in light sandy soil, and plunged in a gentle heat. They also produce seeds, which should be sown in March.

CULTURE OF THE HYACINTH.

The Hyacinth is a native of the Levant, and is said to be abundant about Aleppo and Bagdad. It has been cultivated in Holland with great success for several centuries. Some of the sorts have been sold for incredible sums, as 200*l.* or 300*l.* for a single bulb. There are but three species known in this country, the *H. amethystinus, brumalis,* and *orientalis.* The varieties of the last species are very numerous, amounting to many hundreds, all very beautiful, but the names of which are entirely arbitrary. The following select list may probably be some guide in the purchase of a small number, when the individual purchasing is unacquainted with them :—

Double White.

Anna Maria
Gloria Florum Suprema
Grand Monarque de France
Héroine Grande
La Mode Epuisée.

Double Yellow.

Alexander Grande
Bouquet d'Orange
Duc de Berry d'Or
Jaune Pyramide
Ophir
Pure d'Or.

Double Blue.

Bouquet pourpre
Grand Vidette
Gustaff de Deide
Quentin Durward
L'Abbe de Verroch
Rudolphus.

Double Red.

Acteur
Augustus Rex
Duchesse de Parma
Henri Quatre
Marquesse de la Costa
Rex rubrorum.

Single White.

Grand Vainquer
Prince de Galitzin.

Single Yellow.

Princess Charlotte
Princess of Orange.

Single Blue.

La Crepuscule
Nimrod.

Single Red.

L'Eclaire
Temple of Apollo
Van Wondell.

To grow Hyacinths to perfection, the following rules may not be without their use:—

1. The soil should not be too heavy, but of a fine rich nature. Let the component parts for a bed be as follows:—equal parts of rich loam, taken from the top spit of a pasture field, very rotten cow-dung, at least two years old, leaf-mould, peat, and fine sand. Break the turf well, throw it in a heap, and frequently turn it, until it is well rotted, then mix the whole together, and allow the compost to lie, if possible, six months before it is used. Sea-sand is preferable to any other if it can be procured.

2. The bed on which the bulbs are to be planted, should be made about four feet wide, in a warm and dry situation, for, although hyacinths grow freely in water alone, they soon receive injury or entirely perish if planted in wet situations.

3. When the situation for the bed is determined upon, dig out the soil two feet deep, and loosen that at the bottom of the trench, so that all superfluity of moisture may be able to drain away; then lay about four inches of rotten cow-dung at the bottom, and fill the trench with the above compost to eight inches above the surface of the surrounding ground in the centre, and two or three inches at the sides of the bed. Some persons make their beds with a regular slope from back to front, facing the south; and this system is not without its advantages.

4. Always make the bed by the middle of October, which will be about a fortnight before the time of planting. This gives it time to settle properly.

5. *Choice of Bulbs.*—The bulbs most likely to flower best are those of a middle size, solid, and conical; all flat crowned ones are apt to break into offsets, and at best produce very poor flowers.

6. *Time of Planting.*—The best time for planting is the beginning of November, although some persons do it as early as the third week in September, but when done so early the plants usually appear above ground in the depth of winter; others again do not plant till the end of November, or even later; but in this case the roots become greatly weakened by their tendency to vegetate.

7. *Manner of Planting.*—The bed having well settled, prepare to plant by raking the surface smooth and level, then spread over the whole about an inch thickness of dry sandy soil, mark out the rows on the bed either lengthways or across (the former looks the best), eight inches apart; this can readily be done either by means of a line, or, if across, a rod. Having marked out the rows, mark the exact spot for each bulb in the rows eight inches apart, planting them so as to form triangles. Lay in each marked spot a small quantity of sand for the bulbs to rest upon.

8. This being done, select the bulbs and place them in the situations appointed for them, carefully avoiding two of the same colour coming in contact with each other; then take a handful of sand and place it upon and around each bulb, so as to cover it. After which cover the whole bed with fresh light loam until the bulbs are covered two inches deep, smooth the surface, and the business is completed.

9. *To Preserve from Rains and Frost.*—Some persons follow the practice of covering the beds with three or four inches of rotten dung, but this is always

injurious more or less; dry litter answers the end much better than either rotten dung or turf; but when the weather is windy, this is apt to be blown off, and make the garden look uncleanly. The best way of all is to hoop the bed over, and cover it, when necessary, with mats; for moderate rains and slight frosts covering need not be resorted to, if about three inches thickness of old tan be laid over the bed on the approach of winter; that is, about the beginning of December.

10. When the weather is fine, the bed must always be exposed to effects of the sun and air, or the roots will grow and flower weakly.

11. From the beginning to the middle of April the flowers will begin to show their colours. If the sun is powerful, shading must be resorted to, or some of the finer coloured sorts will be faded; this may be done by means of mats and hoops; but a neater covering is that of an *awning*, which should extend over the walk round the bed also. The framework of this awning merely consists of four or more posts about seven feet six inches high, being placed firm in the ground, either two or more on each side the bed, according to its length; on these posts should be fixed a frame made of light materials, in the form of the roof of a house. On the roof of this frame, and as far down the sides as is necessary, the sheet or canvass may be strained, and if rolled up or let down by means of cords and pulleys it will still be more convenient.

12. When the flower-stems have grown about four inches high, it will be necessary to tie them to neat thin sticks, or they are liable to be broken by the wind.

13. Unless the season be excessively dry, watering is always unnecessary, for the dews and rains which fall upon the beds are usually more than sufficient. And after the flowers fade, and the foliage begins to die, moisture becomes injurious.

14. As soon as the flowers begin to fade, the awning should be removed, or the bulbs will be greatly weakened: still the roots must be preserved from heavy rains by means of mats and hoops; the mats being thrown over just at the time of the shower, and removed as soon as it is over.

15. When the leaves are somewhat withered, immediately proceed to take up the bulbs; carefully avoid cutting off the leaves until they are perfectly dead, for if the tops be cut off too soon, canker and rottenness is the consequence.

16. When they are taken up, rake the surface smooth on part of the bed, and spread about an inch thickness of sand over it; then lay the bulbs on the sand at such a distance as not to touch each other, and cover them with dry sand, being careful not to cover the dying leaves; there let them remain exposed to as much sunshine as possible, but secured from all rains or moisture until the roots are perfectly ripe, which will be in about a fortnight or three weeks.

17. When the bulbs are thoroughly ripe, which will be known by the leaves having become entirely shrivelled and dead, cut the tops off from the crown of the bulb quite close, taking care not to cut into the living part of the crown; rub off the dead fibres, and spread the bulbs in a dry airy room for a few days, cleaning off all soil or dead loose skins that may adhere to them, separate the offsets, and wrap up the bulbs in paper bags until the time of planting again.

18. *Forcing.*—The bulbs of hyacinths are weakened by forcing, but they usually produce the finest offsets, which, when judiciously treated, will soon flower very finely. There are two or three ways of growing them in houses, either in pots or glasses, or fine sea-sand.

19. *Growing in Pots.*—In preparing pots for them, select such as are about four or six inches deep, according to the kind intended to be planted, and three inches wide; put a little rotten dung in each pot; fill each pot up with light rich soil, and plant the bulbs so shallow that nearly half the bulb stands above the soil. Plunge the pots in the open air, and cover them six or eight inches deep with rotten bark, or light sandy soil. During spring take them out as they are wanted to be brought into flower, and set them either in a greenhouse or in the window of a warm room.

20. When the flowers begin to expand, and during the whole time of flowering, supply them with manure water; but as soon as the flowers fade, and the leaves begin to decay, cease by degrees to water them, until at length it is discontinued altogether, for when the leaves are dying water becomes injurious.

21. *Growing in Glasses.*—The best kind of glasses for the purpose, are those of a dark green colour, the roots of the bulbs are not so liable to be injured as those in the light coloured ones: but with care either kind will do.

22. Place the glasses in a light airy situation, and the water will require to be changed once in three or four days.

23. If drawn up weakly, it will be necessary to support the stems with sticks, split at the bottom, so as to fit on the edge of the glasses at the top. This, however, will not be necessary if they be kept in a light and airy situation.

24. When out of flower, plant them in pots of soil, to perfect their leaves; place them in a situation where they will receive a gentle warmth; water as often as they require it, until the leaves begin to fade; then treat them as recommended before, and they will flower again the succeeding year.

25. *Growing in fine Sea-Sand.*—It has been stated that hyacinths grow better in fine sea-sand than in water-glasses. We are scarcely prepared to speak either for or against the practice, having never tried the system. There is little doubt, however, according to our judgment, but sand would answer, if it were kept constantly moist; but if allowed to become dry, the bulb would evidently not make much progress.

26. *Diseases.*—They are subject to numerous diseases, particularly one termed the ring: the cause of this malady is yet unknown. It has been found that bulbs, kept regularly in the open ground, are not liable to it like those dried and kept up in bags. The only remedy known is, to cut out the infected part as soon as it appears, and expose the wound to the influence of the sun and air, until it is healed. The crown of the bulb is sometimes injured by the bed being exposed to heavy rains: by this the bulbs will grow into off-sets, and not flower. Others again have their fibres injured from the same cause, by which means they flower very weakly; as they do also when infested with the wire-worm.

27. *Propagation by Off-sets.*—These may be planted on beds a fortnight sooner than the usual time of planting the flowering bulbs. Make the bed of good light

rich mould, raised six inches above the level of the surrounding ground, rounded as recommended for the flowering bed.

28. Plant the bulbs in rows, six inches apart, and four inches from bulb to bulb, or closer if they are very small; cover them with about two inches of light dry soil; and nothing more is necessary than to keep the bed free from weeds, and occasionally stirring up the soil on the surface of the bed.

29. Take them up at the same time as the flowering bulbs, re-plant them at the proper season, and treat them afterwards in every respect as the old bulbs.

30. *Propagation by Seeds.*—Select some of the finest single or semi-double ones for producing seed, such as have strong fine stems, and well-formed bells; but always prevent the bulbs intended for flowering the succeeding season from bearing seed, or they will be materially weakened.

31. Never gather the seed until it is perfectly ripe, which will be known by the seed-vessels beginning to open. Cut off the whole stem, and place it on a sheet of paper in a dry, airy room, until the time of sowing. This is always preferable to clearing it from the husk, because, when done so, it is apt to shrivel, and seldom grows freely.

32. The best time to sow is in October, about the same time that the off-sets are planted. Fill boxes or pans with good light loam and sand, or with the same kind of soil as recommended for planting the bulbs in. Cover the seed not less than one-fourth of an inch, nor more than half an inch deep.

33. When the seed is sown, place the pans or boxes in a green-house, or frame, during winter. In the spring remove them to a somewhat shaded situation; and they require little attention, except keeping clean from weeds, until they are up; they will then probably require occasionally watering. When the tops have died down, add a thin layer of fresh soil to the top, but without disturbing the roots, until the leaves have died the second year, when the bulbs may be taken and replanted, after the manner of old bulbs or off-sets.

34. If so treated, some of the strongest will very likely show flower the third or fourth year after sowing; they may then be selected—the good ones for beds and forcing—the moderate ones for border-flowers.

Criterion of a good Hyacinth.—"The stem should be strong, tall, and erect, supporting numerous large bells, each suspended by a short and strong peduncle or foot-stalk, in a horizontal position, so that the whole may have a compact, pyramidal form, with the crown or uppermost flower perfectly erect. The flowers should be large and perfectly double; that is, well filled with broad, bold petals, appearing to the eye rather convex than flat or hollow: they should occupy about one-half the length of the stem. The colours should be clear and bright, whether plain, red, white, or blue, or variously intermixed and diversified in the eye: the latter, it must be confessed, gives additional lustre and elegance to this beautiful flower. Strong bright colours are, in general, preferred to such as are pale."

Maddock, and Encyclop. Gard.

PROPAGATION AND MANAGEMENT OF GREEN-HOUSE, CONSERVATORY, AND STOVE PLANTS,

AS DETAILED BY MR. FORBES, IN HIS "HORTUS WOBURNENSIS."

THE propagation of green-house and conservatory plants will require to be performed at various periods throughout the year, as the cuttings should be put in according as they appear in a fit state; that is, when the young shoots begin to assume a brownish colour, and are getting of rather a firm texture, as many of the sorts are liable to damp, or rot off, when the wood is soft and young.

Previously to preparing the cuttings, there should be a pot or deep pan got in readiness, well drained, and filled with the soil or sand, as the nature of the plant may require. The hard woody kinds will strike root best in sharp sand, while the soft or herbaceous-like sorts, will root freely in a mixture of sand and loam. There should also be got ready the frame for sowing tropical seeds, &c., into which such sorts as require a little bottom heat may be plunged as soon as they are put in the cutting pots. Those species which are put in early in spring will succeed better by the assistance of a little heat applied around the pots: but when the season is more advanced, they will readily strike root without it.

In preparing the cuttings, care must be taken not to injure the bark in the removal of the leaves, which should be cut off close to the wood, as far as is necessary for that part of the cutting to be inserted in the soil; none of the upper leaves ought to be shortened or removed; nor should they be planted deeper in the soil than is requisite for the fastening of the cuttings: when they are put in, a little water should be given, to settle the soil or sand more firmly about them. As soon as the wet has evaporated from their leaves, they should be removed to the propagating frame, and if covered with bell or hand-glasses, the surer in general will be the success; although many of the sorts will strike very freely without them, provided they are not exposed to too much air, and are shaded from the effects of the mid-day sun.

The cutting pots will require to be frequently examined, and should not be permitted to become either too wet or too dry, but be kept in a medium vegetating state of moisture. The glasses will require occasionally wiping, to prevent the damp from injuring or rotting the leaves of the cuttings. As soon as the cuttings have struck root, and begin to grow, they ought immediately to be potted off in small sized pots, and replaced in a frame, where they can be gradually hardened, and acclimated to the temperature of the green-house, previous to their removal out of that department. There are, however, many species of plants, we cannot propagate by cuttings of their branches, and we are, consequently, obliged to have recourse to other means of propagation to increase the stock; such as by grafting, budding, layering, inarching, and the saving of seeds.

The most natural and successful method of procuring plants is unquestionably by seeds; but as many of our most valuable sorts do not flower in this country, no seeds can ever be obtained in this case. There are, likewise, several kinds that can be readily increased by cuttings of the roots, which will not propagate from the shoots, or produce seeds freely. When, however, a collection of seeds can be procured from abroad, in a recent state, there is a great chance of obtaining new or rare plants: a portion of such should be sown immediately on their arrival, as many of them will be found to vegetate when first received, that would not, if kept to the ensuing spring. Those from a tropical country will require a moderate bottom heat to assist their germination.

Seeds from New Holland, the Cape, and other mild climates, will vegetate readily by being placed in a cold frame, or in a cool shaded part of the green-house, and kept regularly supplied with due proportions of water, so that the soil in which they are sown may be kept in a moist vegetating state. The green-house plants, as well as all other scarce sorts, which have flowered during the season, should be carefully examined, to see if they have perfected their seeds, when a collection of all the most valuable species should be gathered, as they ripen, and should be laid up until the following February, when a general sowing should be made.

The seed pots ought to be well drained with broken crocks, or small stones, or cinders, and then the remaining space filled up with light sandy loam and peat, well incorporated together, and finely sifted for the small seeds. As all the sorts will not vegetate at the same time, some will make their appearance in a few weeks, whilst others may remain dormant for nearly two years, and afterwards vegetate: we must, therefore, never be too hasty in throwing away the seed pots, until we are thoroughly convinced that there is no chance of any of the remaining seeds coming up.

As soon as the seedling plants appear above ground, they should be carefully watered with a fine rose watering pot; and when they get a little advanced in their growth, should be potted off into small pots, and replaced in a frame, where they can be shaded and attended with water, until they get established in their pots, and are hardened by degrees to the temperature of the green-house, to which they should be removed. Such plants as appear to be drawn up weakly should have their tops pinched off, which will induce them to shoot into handsome bushy plants.

MANAGEMENT OF HOTHOUSE PLANTS.—The house intended for the growth of stove or tropical plants, should be constructed so as to give a proper command of artificial heat in the winter season, when a high temperature is requisite for the preservation of the plants. These being natives of warm climates, require a strong degree of heat, to induce them to grow and flourish in the confined apartments that are allotted for their cultivation.

The soil that appears most appropriate for the growth of the greater portion of stove plants, is sandy loam, consisting of the sward from a pasture, which should be thrown together in a heap, to decompose and pulverise for a short time previous to using; to which a portion of peat soil, mixed with it, will be a suitable compost for the growth of most tropical plants. Where there is a scarcity of peat, a mixture of decomposed leaves of trees may be applied in its stead, with great advantage. Should the soil not be of a naturally sandy quality, a little sand should be intermixed, so as to render it light and free for the roots to run in.

The pots in which they grow, must be well drained with small pieces of potsherds, or any other material that will permit a free passage for the superfluous moisture. There should be placed next the drainage, a little of the rough fibrous substance that is collected from the soil, which will admit of a ready penetration of the water through it, and prevent the mould in the pots from becoming too much saturated with wet; as nothing is more injurious to the tender roots than to have the soil soured about them when in a dormant state.

Most sorts of tropical plants are increased, either by cuttings, seeds, or dividing the roots; whence off-sets of the Orchidea and Cryptogamia genus are procured: and when those throw out such suckers, or side off-sets, we have a plant supplied with roots immediately, which may be at once potted, and treated accordingly. These suckers, or offsets, should be allowed to form good roots before they are taken from the mother plant.

The hard woody kinds may be propagated by cuttings, which will root freely, in most instances, when planted in sharp sand, and placed in a shaded situation of the stove, or any other apartment where they can be shaded from the effects of the mid-day sun; as a small pit or frame is generally appropriated to this purpose, which can readily be shaded, by throwing a mat over the lights while the cuttings are striking root. Some of the species will require a slight degree of bottom heat, to induce them to throw out young roots.

The most suitable season for propagating tropical plants, is from January to July: but many of the kinds may be put into the cutting-pots at any period of the year, providing the young shoots are in a proper state, as some species require the wood to be ripened and firm before they are put in; whilst others may be increased when the shoots have grown only sufficiently long for the cutting.

CULTURE OF THE ANEMONE, OR WIND-FLOWER.

There are more than sixty species of Anemone known to botanists and gardeners, all of which are showy, and well worth cultivation.

The *A. capensis* and *tenuifolia* are greenhouse herbaceous plants, and require similar treatment to other Cape herbaceous plants; viz.:—

Pot them in a mixture of equal parts of light sandy loam, very rotten dung or leaf mould, sandy peat and sand. Break and mix these well together, but do not sift them, with the exception of the dung, which should be sifted before being added to the rest.

Carefully avoid over-watering them when in a state of torpidity, but give a good supply when they are in a state of active growth and flowering.

There are three modes of increasing these—by seeds, cuttings, and division of the roots.

Seeds.—Sow these early in spring, in light soil, and plunge the pots in a gentle heat until the plants appear, then give abundance of air; afterwards transplant into single pots, and finally treat like the old plants.

Cuttings.—These should be taken just at the time when the flowers begin to fade; that is, about April. Plant them in the same kind of soil as mentioned above. This may be either done in pots, or otherwise. In either cases they should have a little bottom heat, and be covered with glass.

Division.—This is performed early in the season, just before the plants begin to grow.

All the hardy herbaceous species thrive well in a light loam, and require very little care.

They are readily increased by division of the roots and seeds, which some of the species produce plentifully.

Many of the herbaceous kinds are very handsome flowering plants, and deserve every attention that can be shown them.

All the tuberous-rooted kinds are propagated either by parting the roots, or by seeds. Two sorts are in particular repute, and are grown in our gardens as florists' flowers—the *A. coronaria* and *hortensis.* The former of these has broad round petals, the latter narrow and pointed ones. Both have numerous varieties; and their culture may be taken as the standard for the whole of the tuberous-rooted kinds.

Culture of the A. hortensis.—This species is cultivated in the same manner as the single variety of the *A. coronaria.* It is not usually grown in beds, but commonly in patches on the flower borders; and for this purpose the seed is often sown in pots, and turned out entire, or sown in the border at once. The season for sowing is as soon as the seed is ripe and gathered, in preference to keeping it till spring, by which a season is lost.

Poppy, or Garland, Anemone (*Anemone coronaria*). Both the single and double varieties of this species are numerous, and common in our gardens, in which, when in flower, they are great ornaments. They are very hardy, easy of culture, and flower at almost all seasons of the year.

The history of this flower is curious. It is said to have been brought to France in the early part of the eighteenth century. The kind first introduced was the semi-double, or the seed-bearing variety. The gentleman who brought it to Paris was exceedingly jealous of his flowers, and no entreaty could prevail upon him to part with one of them; but they were at last procured by a trick.

A person to whom he was showing his parterre, let fall his cloak, as if accidentally, on the Anemone bed; and, hastily gathering it up, with an apology for his awkwardness, some of the seed, as was intended, stuck to the velvet, which a servant, who was in the secret, hastily picked off and concealed. The seed thus obtained was sown, grew, and, by the liberality of the ingenious plunderer, the flower soon became common in Paris and throughout Europe*.

Criterion of a fine double Anemone.—A perfect double Anemone should have its flower-stem from eight to nine inches in height, and of proportionate strength; its blossom at least two inches broad; its guard leaves † large, rounded, horizontal, and turning a little upwards, forming thereby a shallow cup, filled in richly with long fine petals, regularly piled one over the other (not crowded confusedly) whose colours, as well as those of the exterior leaves, should be bright, and distinctly marked in *variegated* flowers; and, as it were, should be *too brilliant* for the eye to rest upon, in those that are of a single colour, which are termed self-coloured.

Anemones require very similar treatment to Ranunculuses, but are much hardier.

1. The soil in which Anemones thrive best, is a fresh loam, rather inclined to be strong than otherwise. A small portion of very rotten dung, or leaf-mould, is necessary, but scarcely so much as the ranunculus. In preparing the bed, take out the old soil one foot deep; lay about six inches thickness of well-rotted cow-dung at the bottom of the trench; then obtain some good rich loam (the top spit from a pasture), break it well, and mix with it about a tenth or twelfth part of very rotten cow-dung, at least two years old. Fill the trench with this compost to six inches above the level of the surrounding surface, sloping it on each side from the middle. This should be done not later than the beginning of October; and, for early flowering, not later than the middle of September.

2. The seasons for planting are September, October, November, December, February, and March. Those planted in September will flower in the beginning of April; those in October, will flower by the end of April; those planted in November, flower in the middle of May; those in December, flower by the end of May; those in February, flower the beginning of June; and those planted in March,

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* Hort. Reg. Vol. ii. p. 28.

† Outer row of petals.

flower by the middle of June. But if it is desired to have them flowering the whole year, plant exactly as recommended for ranunculuses, vol. i., p. 45, rules 11—13.

3. The best season for planting, to ensure a good bloom, is February, because all danger is then over of their perishing by frost or excessive wet. Those planted in the autumn will be a little sooner, and are sometimes as fine as can be wished. This depends, however, on the fineness of the weather during winter; for if they are not sheltered from excessive wet or severe frosts, the roots are liable to rot.

4. Use long litter, in preference to rotten dung, for sheltering the roots from frost. The latter often doing more injury than the frost, from which they are intended to be protected.

5. In planting, either during autumn, spring, or summer, never plant in holes made with a dibber, but either draw broad drills, or, what is far better, mark with a rod some lines across the bed, six inches apart; place the roots carefully with the crowns upwards, six inches apart in the rows; then cover them with not more than two inches thickness of light dry soil.

6. Never select large overgrown roots for planting in a flowering bed; they are usually hollow, and often decayed in the inside, and seldom flower well, sometimes not at all; but choose roots of a moderate size, that appear fresh and plump.

7. It is indispensable that no raw turf be in the soil in which the roots are planted, or they will not grow well in it.

8. When the leaves appear above ground, choose a dry day to press the soil firmly about the roots, which is done best with the hand; for, if the weather proves dry, the crowns of the roots, if exposed, will receive injury.

9. If the weather proves dry through April and May, the beds will require watering; and this must be continued, as often as necessary, until they are in full bloom.

10. In all situations where the sun has great power, the beds will require shading, or the leaves will become yellow, and but few flowers will be produced. When they come into flower, shading is always necessary, or the rays of the sun will affect the brilliancy of the flowers, and the growth of the roots; but no shading should be nearer the ground than a foot and a half, nor must it prevent a free current of air passing under it, or the stems will be weakly. It must, also, be so fixed, that it may be rolled up morning and evening to allow the plants to receive a little sun, or the colours will be pale. But if the cultivator is not particular about the colours running a little, shading need not be resorted to at all, except in excessively dry hot weather.

11. Never allow the roots to remain in the ground after the herbage is dead. They continue in a state of growth much longer after flowering than the ranunculus, which no doubt arises from the more succulent nature of their roots.

12. If the weather be wet after the plants have done flowering, still allow the covering to remain over the bed, to prevent the roots from absorbing too much moisture; or the foliage does not die down at the usual time, nor do the roots attempt to ripen, but often strike roots again, and thus become much weakened.

13. If it is necessary to shelter the beds from excessive rains, yet the plants must

have as much sunshine as can be given them, or the roots will not be fine and plump.

14. When the roots are taken up, cut off their dead stems nearly close to the root; spread them in a shady, but airy room, to dry gradually, and frequently turn them, or they are liable to mould.

15. When they are about half dry, clean and separate the dirt from them. This must be done with great care, as they are very brittle, much more so than ranunculuses: and should any pieces be broken off in the operation, these must be preserved and planted by themselves; for they will all make flowering plants if they possess eyes, which will very probably be the case.

16. In about a month after the roots are taken up, separate the offsets from them: this is a far better time than either at the time of cleaning, or planting; for in the first case the smaller offsets, by being separated so early, become very shrivelled, and the larger ones lose their plumpness; and if separated at the time of planting, the wounds of neither the parent root nor the offsets have time to heal, and are therefore liable to perish in the ground.

17. When dry, put them in bags or boxes, exactly as recommended for the ranunculus, vol. i., p. 44, rule 10.

18. *Propagation by Seeds.*—Select well formed and brilliant coloured single or semi-double flowers, from which to collect the seed. The greater part of the plant, grown from seeds, will of course prove single, but a few very good ones may be expected.

19. Gather the seed every day as it ripens, and when a quantity is gathered, sow it immediately. This may be done either on a bed, or in boxes or pans: if in either of the latter, give a good drainage, and let the soil with which they are filled be a mixture of light loam and leaf mould.

20. The downy substance with which anemone seed is enveloped, renders it difficult to be sown in a regular manner. To remedy this, it is necessary to mix a quantity of fine sand with the seed at the time of sowing, which, if well rubbed with it, will prevent it from falling on the bed in lumps.

21. If sown in pots or pans, treat them exactly in the same manner as recommended for seedling ranunculuses, vol. ii. page 45, rule 15. But if sown on a bed, little trouble is required, except to shelter the bed a little during winter, and allow them to remain until they flower; top dressing when they require it, by sifting a thin layer of good rich soil over the bed, having previously loosened the surface of the bed for the purpose. After they have flowered, the bulbs may be taken up and planted in the borders or on beds, and treated as old roots.

THE SIZES OF FLOWER-POTS DISTINGUISHED BY NUMBERS.

The smallest sized ones are called thimbles, the next size sixties, which are three inches and a half deep, and three inches and a half wide at the top; forty-eights are four inches and a half deep, and four inches and a half wide at top; thirty-twos are five inches and a half deep, and five inches and a half wide at top; twenty-fours are six inches and a half deep, and six inches wide at top; sixteens are eight inches deep, and seven inches and a half wide at top; twelves are eight inches and a half deep, and eight inches and a half wide at the top; eights are nine inches deep, and nine inches wide at top; sixes are ten inches deep, and ten inches wide at top; fours are eleven inches deep, and eleven inches wide at top; twos are twelve inches deep, and twelve inches wide at top; all inside measure.

It must be remembered that these dimensions vary more or less, in the formation of what are called *flats* and *uprights;* the former are of greater diameter than depth, the latter of greater depth than diameter; and these variations are considerable at the different potteries, but all are made to contain nearly the same portion of soil.

ON KEEPING DIFFERENT KINDS OF TENDER PLANTS IN A DORMANT STATE, IN FLOWER-POTS PLACED IN CELLARS, DURING WINTER.

When any of our readers have a large collection of ornamental plants, and possess but little accommodation for them in winter, they may be kept in nearly a torpid state in their pots, in sheds, out-houses, cellars, or any unoccupied rooms which may be spared for use. The plan has been adopted extensively by Mr. John Street of Biel, and was communicated to the Caledonian Horticultural Society in 1829, from whose transactions we extract the following account of experiments:—

Scarlet Geraniums (Pelargoniums) of several dwarfish varieties, and which have been cultivated in pots during one or two years, will then be large enough to plant out in the open borders, but remaining in their pots. Their roots will soon get through the hole at the bottom of the pot, if it be not too closely stopped up. The roots will also get over the pot-rim into the border earth. Here they thrive well until the hard frosts in November. Then take up the pots with the plants, and keep them in a dark, dryish cellar, without giving them any water during the whole winter.

In this dormant state they should remain until they are planted out in the open border again, the next season; probably about the end of May, or early in June, according to the weather: then take them out, prune away any decayed branches or roots, and they will flower freely.

Pelargonium seedlings may also be preserved in like manner. Mr. Street sowed some seeds of five or six varieties of the scarlet in March 1828, which were gathered in 1822. They were sown in a small wooden box, many grew, and they were allowed to stand abroad until November, when he put the box of seedlings into a north shed. They survived the whole winter without any water. They were put in the open air the spring following, and although they received little attention some of them flowered during the summer without transplanting.

Begonia Evansiana.—These, in pots, may be kept in a north shed in a dormant state without water. About the end of March or the beginning of April, they are put under a glass case, in saucers, and watered. They soon begin to grow. Then clear away the surface, or give them a larger pot, or divide them in two or more parts, if the previous pot is considered large enough; however, give them a good top-dressing of rich soil.

With such treatment they grow to near three feet high, and flower freely. Some years they produce seeds—true seeds—not merely the bulbs or buds on the stalks. These plants may be preserved in torpidity till the longest day; then being put in motion, they flower in the autumn of the same year, but not so strong as the others.

Canna gigantea.—This plant requires much room. In autumn 1828, Mr. Street put a young strong plant, growing in a large pot, into a dryish, dark cellar, where it remained in a dormant state, without any water, till the end of April, 1829, when he turned it out of its pot into the open border. It grew very luxuriantly, and flowered freely for a long time. It sent up several flowering stalks, two of which measured six feet eight inches high. In catalogues it is generally marked as a stove plant, and five feet high.

Canna indica, and *C. coccinea, C. patens,* have succeeded with the same treatment.

Crinum longifolium is a bulb which grows to rather a large size, and then requires a large pot. One that flowered strong in 1828, was in the autumn placed in a north shed, and kept in a dormant state without any water until the end of March, when it was taken out of its previous earth, and its offsets were removed. It was then potted in fresh earth, and put under a low glass-case; it flowered well the following summer again. When done flowering it was put under a south wall, where it remained till November 25th quite well: about that time it was put again into the shed to rest all winter.

Commelina tuberosa.—This plant in pots has been repeatedly kept in a north shed all the winter, in a dormant state without water, and then brought into a glazed house at different periods, as in February, March, or April, according to the time they are wanted to flower. Indeed this species accommodates itself to much diversity of treatment.

The same tubers have survived for five or six winters at Biel in the open borders, growing to five feet high, ripening seeds, and sowing themselves, both on the gravel walk and in the border. These self-sown plants flower, and ripen seeds in the same year, so that the plant may be treated as an annual. Its tubers may likewise be preserved in dry earth or sand all winter, like those of the dahlia, or in boxes or drawers.

Datura (*Brugmansia*) *Arborea.*—This plant has been kept all winter, in a pot, in a north shed, in a dormant state, and planted out in the open ground late in spring with success.

From incidental observation, there is little doubt but *Rhus semialata* may be kept all winter in a pot in a north shed.

Very probably there are many other plants, which have not yet been tried to be kept dormant during winter, but which will prove susceptible of that mode of management.

THE CROCUS.

There are curious phenomena exhibited in flowers, by the expansion and contraction of their parts of fructification, yielding protection from wind and rain, and the dews of the night. The crocus is constantly influenced by atmospheric changes, and may also be acted upon in a similar manner by artificial means. The following results, among others, were submitted in the spring of 1831 :—

The flowers having been gathered at night, when their corollas were perfectly closed, were placed at the distance of nearly a yard from two lighted candles, and in a temperature of 50° Fahr. In this situation and warmth they remained two hours, but their petals remained nearly closed.

Other flowers were gathered at the same time, and being entirely excluded from light, were submitted to a warmth of 95°, the temperature being very gradually raised from 65°. Their continuance during two hours in this situation occasioned but very little change in them.

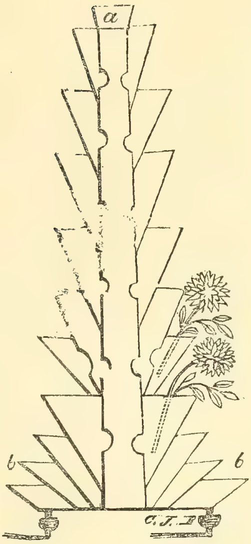
Others were also gathered, and placed between two lighted candles at four inches from each, and in a temperature of 70° to 75°. These flowers, in rather less than an hour, were as fully expanded as in the mid-day sun.

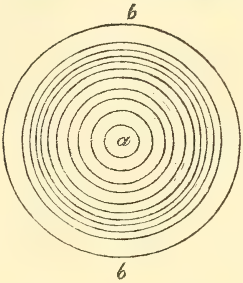
POROSITY OF WOOD.

The porosity of wood is so remarkable that air may be transmitted in a profuse stream, by blowing with the mouth through a cylindric piece of dry oak, beech, elm, or birch, about two feet long. If a piece of wood or stone be put in water, and placed in the receiver of an air-pump, by withdrawing the external air, the air which has been scattered through the pores of these bodies will issue from every point of their surface, and rise in a torrent of bubbles. In like manner mercury is forced through a piece of dry wood, and made to fall in the form of a shower.

DESIGN FOR A FLOWER-STAND.

This design was sent to us some time ago by Mr. Saul, of Lancaster. It is intended for placing cut flowers, which have in it an excellent effect, having the appearance of a complete pyramid. It is well calculated for showing dahlias, &c. Each height of vessels is filled with water, and the flowers placed in, as shown in the outline, beginning at *a*, and filling every vessel down to *b*. The whole is made of tin, and can be manufactured of any size, and for a trifling expense.





WAX PALM.

The *ceroxylon*, a species of palm, so called from its singular property of affording wax, is only found on the Mountains of Quindin, in South America. Tropical plants, in general, do not vegetate at a greater height than 500 toises above the level of the sea; it is singular, therefore, that the wax palm is never found below 900, and that it grows in great profusion at 1450 toises, where the mean temperature is from 66° to 68° Fahr. It sometimes also springs up and thrives in regions 1000 toises higher, and in a temperature 30° below that in which any other of the same tribe or family are to be found. The wax palm rises to the prodigious height of 180 feet, and its leaves are 20 feet in length. A remarkable circumstance in this tree, is, the secreted matter with which its trunk is covered, to the thickness of nearly two inches. This substance, according to the analysis of Vauquelin, consists of two-thirds of resin, and one of wax. Being extremely inflammable, it is employed by the natives, in conjunction with one-third of tallow, in the manufacture of candles.

OPERATIONS FOR FEBRUARY.

Anemones.—Plant a crop to succeed those planted in the autumn, in prepared beds, page 17, rules 2 and 3.

Anomatheca cruenta should now be potted, in sandy peat and loam, and the offsets separated. Water cautiously till they begin to grow, after which they may have a good supply. Vol. i. p. 103.

Adenandra.—The greater part of the species may be propagated by the end of the month. Take off the tender shoots about half an inch or an inch long; plant them in a pot of sand, or sandy peat; cover them with a bell-glass; or plant them low enough in the pot to allow of a piece of window-glass being laid over the top; place them on a shelf near to the roof of the house, and occasionally give them a slight sprinkling of water, and they will soon grow.

Banksias.—Be particularly cautious not to over-water this month. Vol. i. p. 120.

Brachysema latifolia may now be layered, if not done in the autumn. They will strike without any incision being made.

Calandrinia speciosa, and the other kinds, may be propagated by seeds towards the end. Vol. i. p. 222.

Calceolarias.—All the annual species should be sown on a slight hot-bed towards the end. Vol. i. p. 246.

Calochortus venustus and luteus must be kept in pots in the green-house, until the weather is sufficiently fine to turn them out into the borders. Vol. i. p. 175.

Cyclamen persicum.—As the flowers begin to advance, supply them moderately with water. Vol. i. p. 180.

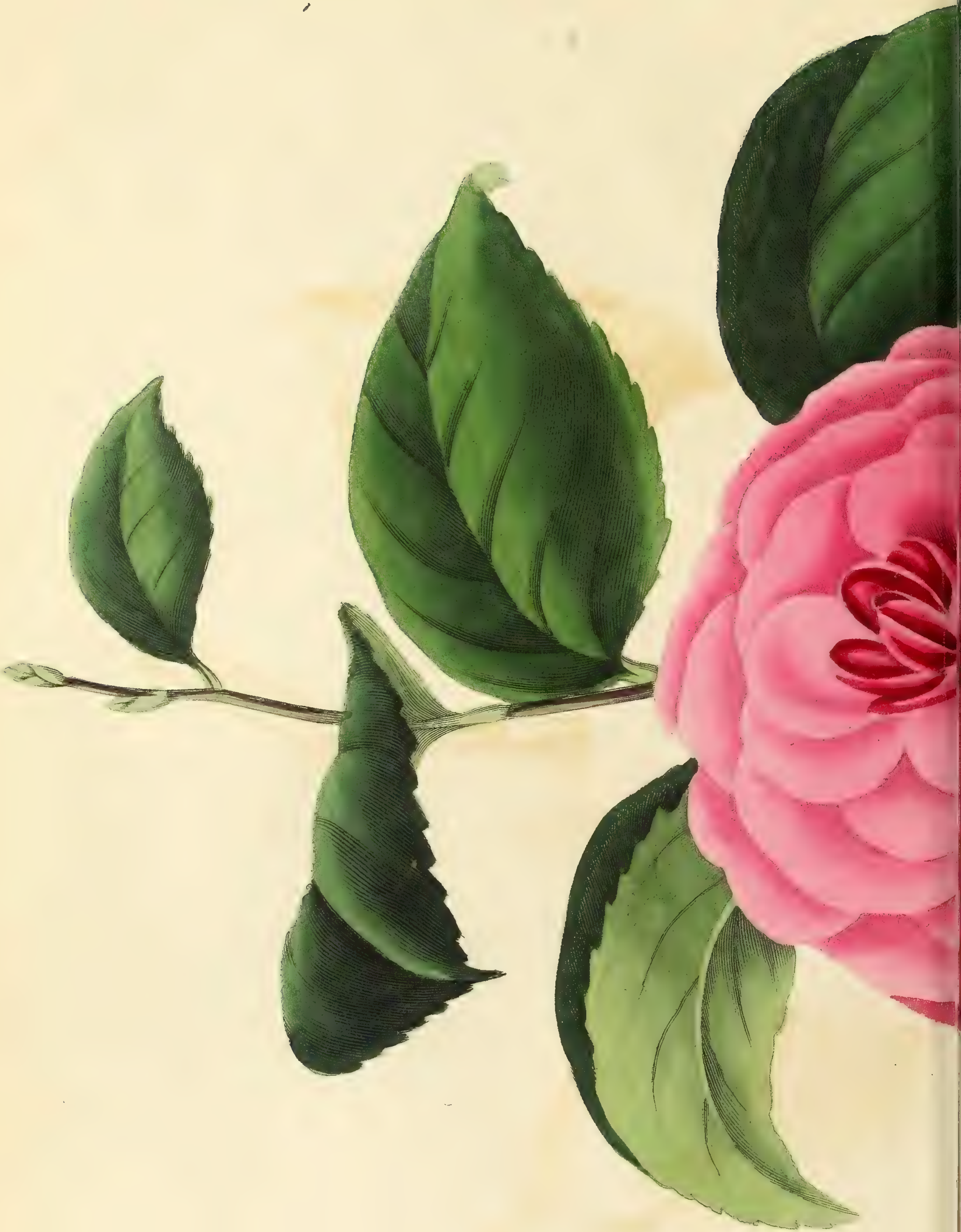
Francoa.—The roots of the different species of Francoa may be propagated by division, at the end of the month; also the seeds may be sown on a slight hot-bed, or in pots or pans. Vol. i. p. 235.

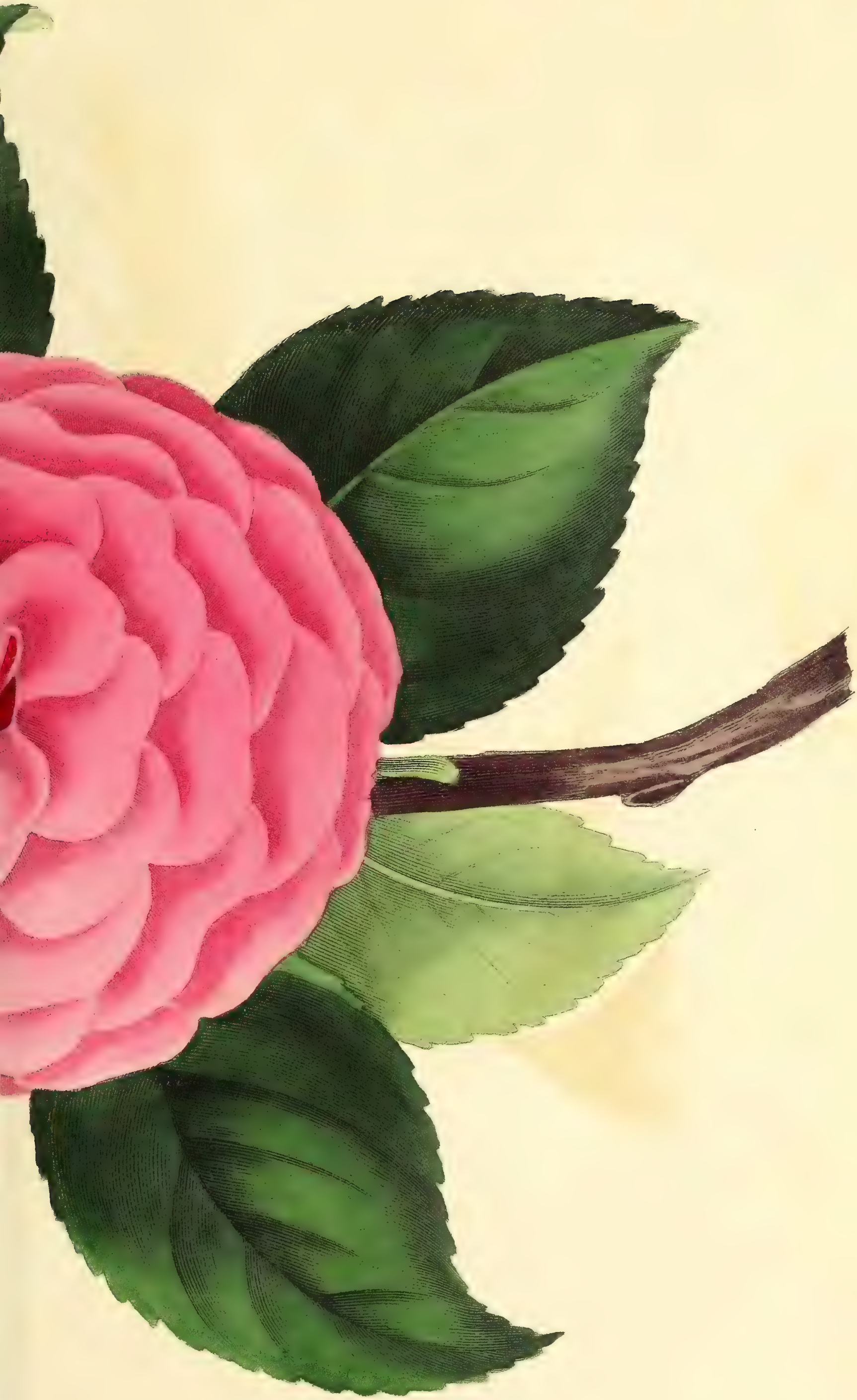
Gardenia radicans should now be shut in a close hot-bed frame, and frequently syringed, to bring them into flower. Vol. i. p. 226.

Gesnerias.—In the beginning of the month, re-pot the tuberous-rooted kinds, and plunge them in the bark bed. Vol. i. p. 14.

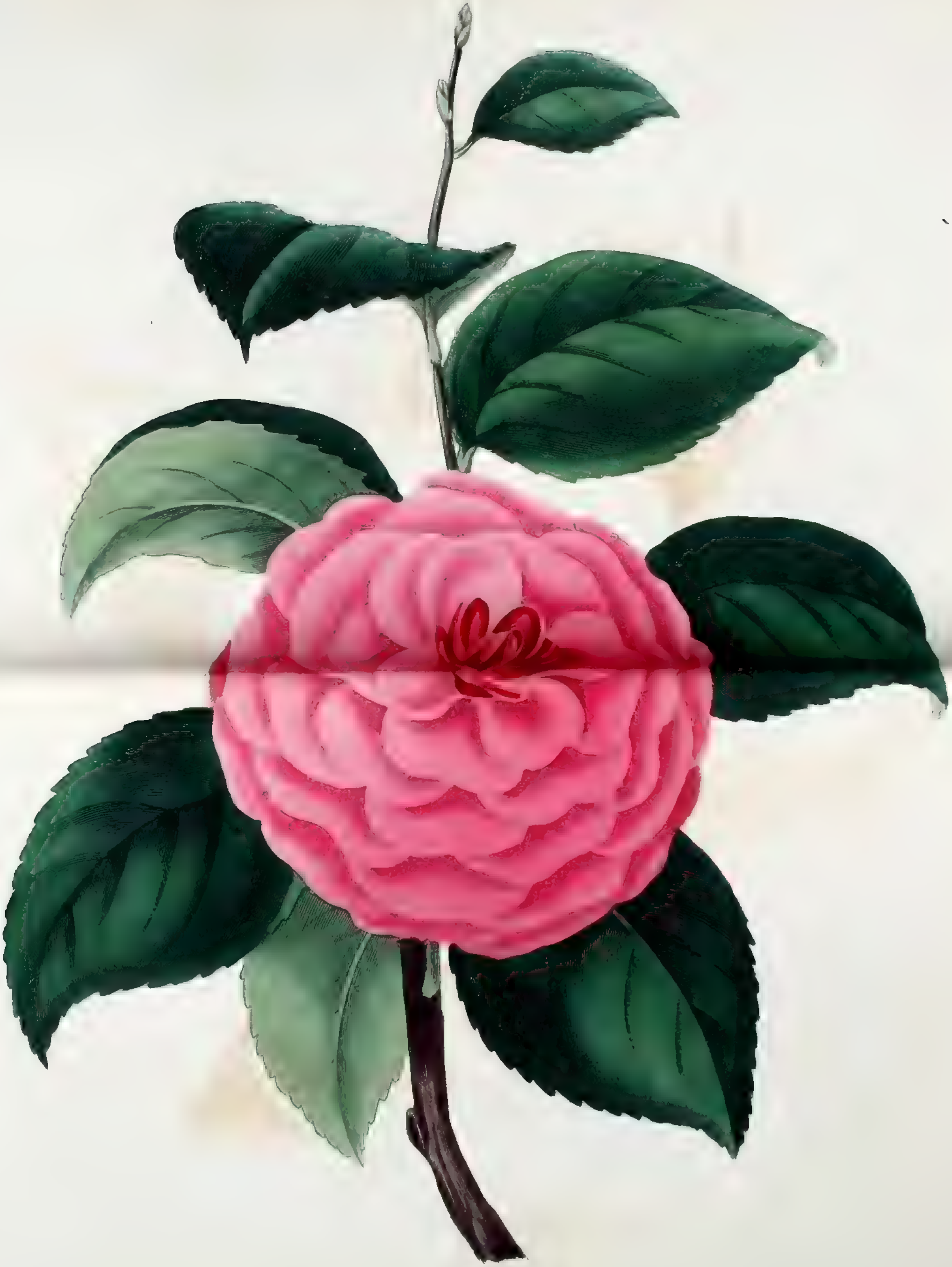
Pomegranate.—Cuttings put in during the autumn should now be plunged in a bark or hot-bed, to induce them to strike roots. Grafting is also performed now. Vol. i. p. 64.

Ribes sanguineum, &c., should now be propagated by cuttings. Vol. i. p. 3.





Camellia Japonica Fieldii



Camellia Japonica [illegible]

CAMELLIA JAPONICA FORDII.

(MR. FORD'S JAPAN CAMELLIA.)

CLASS.	ORDER.
MONADELPHIA.	POLYANDRIA.

NATURAL ORDER.
CAMELLIACEÆ.

GENERIC CHARACTER.—*Calyx* imbricated, many leaved, the inner leaves largest. *Petals* obovate. *Stamens* indefinite in number.

SPECIFIC CHARACTER.—*Stem* shrubby, ten to twenty feet high. *Leaves* ovate-acuminate, serrated, shining, dark green. *Flowers* splendid, nearly solitary. *Calyx* light green. *Corolla* fleshy, bright red. *Stamens* orange yellow.

FORDII *Flowers* large, rose-coloured, very double. *Petals* arranged in the greatest regularity.

THIS splendid variety was communicated to us by Messrs. Lucombe, Pince and Co., nurserymen, Exeter, by whose relative, the late Mr. William Ford, a well known and most successful cultivator of Camellias, it was raised from seed; and out of respect to whose memory, Messrs. Lucombe, Pince and Co. have very properly named it.

It is, undoubtedly, one of the most perfectly formed Camellias that has hitherto been produced. Nothing can surpass the regularity and symmetry of its petals, and the exquisite tint of its delicate rose-coloured flowers. The foliage is remarkably fine, and the style of growth is good. It is highly pleasing thus to find our native varieties rivalling any of those imported from China.

ASCLEPIAS TUBEROSA.

(TUBEROUS-ROOTED SWALLOW-WORT.)

CLASS.	ORDER.
PENTANDRIA.	DIGYNIA.

NATURAL ORDER.

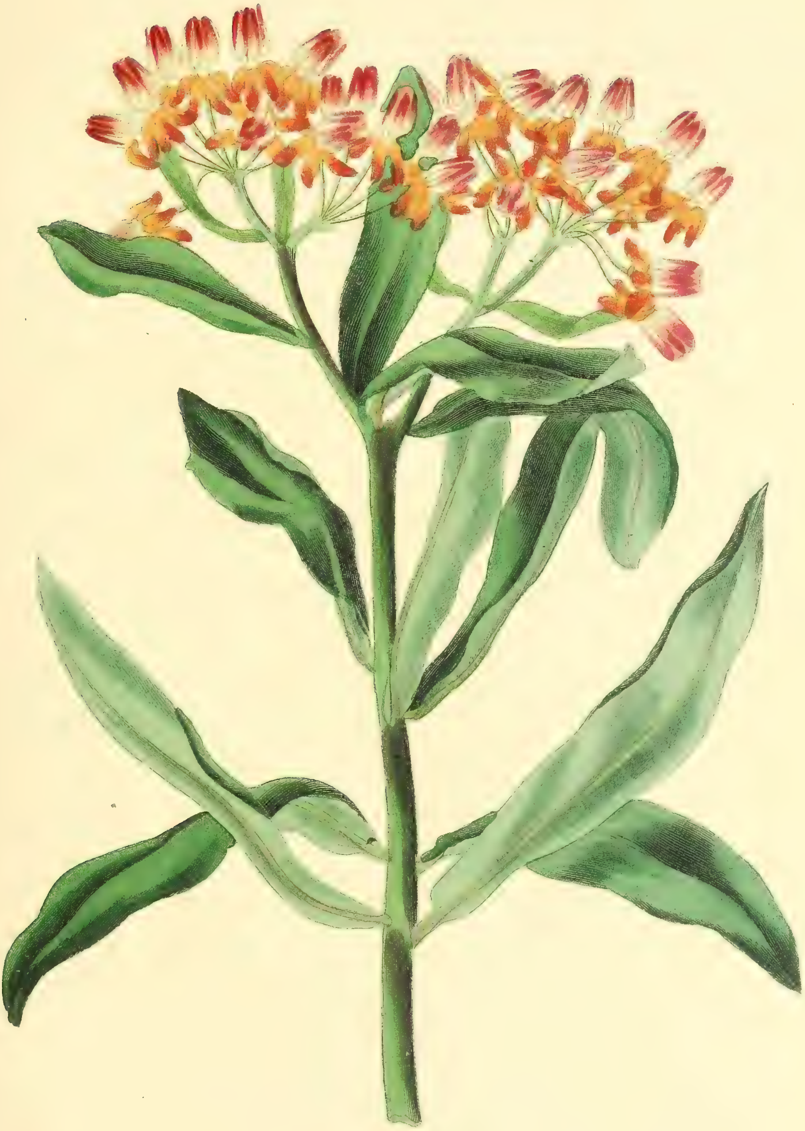
ASCLEPIADEÆ.

GENERIC CHARACTER.—*Calyx* five-cleft. *Corolla* five-parted. Pollen masses fixed by a fine end. *Stigma* depressed, and blunt.

SPECIFIC CHARACTER.—*Root* tuberous. *Stem* erect, hairy, growing two feet high, spreading into numerous branches at the top. *Leaves* opposite, occasionally verticillate, linear-lanceolate, or oblong-lanceolate, hairy. *Flowers* orange, tinged with red.

THIS species is a native of North America, from whence it was introduced so long ago as 1690. It is perfectly hardy, and requires little care to bring it to perfection. The soil should be light (peat and sandy loam suits it best), and the border sheltered and dry. It is propagated by dividing the roots, and by seeds, which it occasionally produces.

All the hardy herbaceous species are easy of culture; the *A. Syriaca* and *phytolaccoides* will grow in any common garden soil, provided the situation be dry; but the *virgata, cenerea, acuminata, amplexicaulis, paupercula, obtusifolia, polystachya,* and *quadrifolia,* flower much finer if the soil be made very rich, if at the same time it be quite light. The *amœna, incarnata, purpurascens, pulchra,* &c. &c., and indeed nearly all the other hardy herbaceous kinds require a large portion of peat mixed with the soil; in fact, they perhaps grow better in peat altogether. They are all increased by division of the roots, and by seeds.



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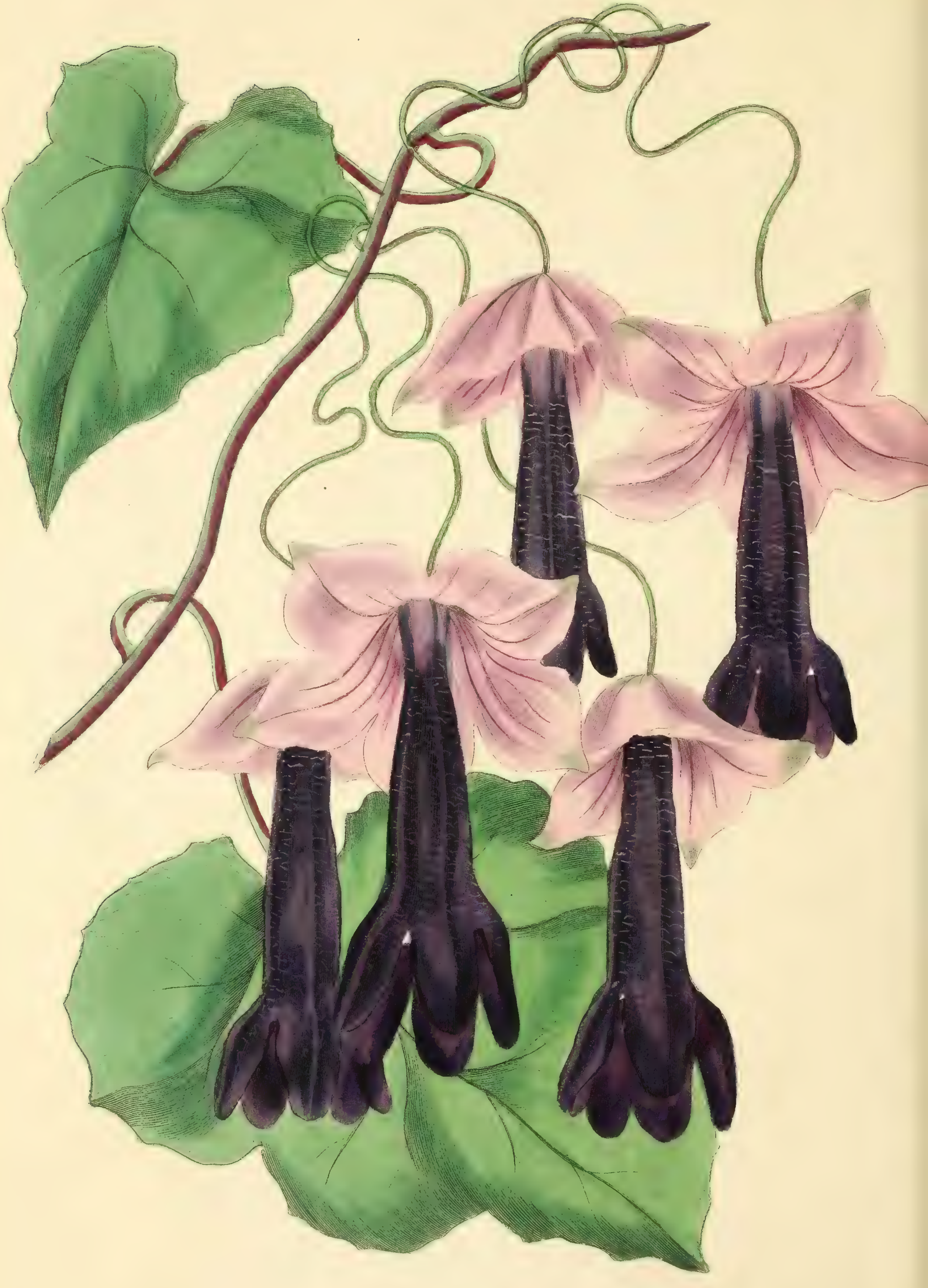
Asclepias tuberosa



F. W. Smith del. et sc.

Rhodochiton volubile.

RHODOCHITON VOLUBILE.

(PURPLE TWINING RHODOCHITON.)

CLASS.	ORDER.
DIDYNAMIA.	ANGIOSPERMIA.

NATURAL ORDER.

SCROPHULARINÆ.

GENERIC CHARACTER.—*Calyx* campanulate, coloured, in five parts. *Corolla* tubular, formed something like a club, ending in a limb, divided in five parts; tube angular, clothed inside with hairs, bent somewhat backward.

SPECIFIC CHARACTER.—A half shrubby climbing plant. *Stem* slender, twining, purple. *Leaves* alternate, cordate, acuminate, toothed, five-nerved, tinged with purple beneath, bright green above, clothed with white shining hairs. *Foot-stalks* upwards of three inches long, somewhat twisted, and of a light purple colour. *Flowers* pendulous, proceeding from the axils of the leaves. *Calyx* large, when compared with the corolla, purple rose-colour. *Corolla* an inch and a half long, deep purple, clothed with white hairs; tube in five angles; limb consisting of five oval lobes. *Stamens* nearly equal, a trifle longer than the tube. *Seeds* numerous.

SYNONYM.—Lophospermum Rhodochiton.—*Don, in Sweet's Brit. Fl. Gard.* 250.

THIS singularly pretty climber is a native of Mexico, whence it was introduced into Germany, and from thence it found its way into the collections of this country; we believe first into that of Mrs. Marryatt of Wimbledon in whose rich garden, we saw a beautiful plant, trained to a trellis, flowering in profusion. The plant from which our drawing was taken, was planted in the open border, and trained to a stake, where it succeeded admirably, growing and flowering the whole of the summer months.

It may be propagated by cuttings and seeds, and requires very similar treatment to the *Lophospermum erubescens;* viz. to be planted in a mixture of loam and leaf mould.

LONDON HORTICULTURAL SOCIETY.

Papers on the following subjects have been communicated to the Society during the past months.—" On the Preservation of Carrots from the Attacks of the Wire Worm." "Notes upon a new hardy ornamental Plant from New Zealand, called the *Clianthus puniceus*," and " A further Account of Experiments upon the Cultivation of the Potato, made in the Garden of the Society in the Year 1834." The first by Sir G. S. Mackenzie, Bart., the two latter by Dr. Lindley. The beautiful evergreen shrub, the description, &c., of which was the subject of the second paper, was found by Sir Joseph Banks and Dr. Solander, during Captain Cook's voyage in 1769, from which period, until lately, it is somewhat remarkable that it had not found its way to this country: since its introduction, it has not been observed to acquire a stature exceeding four feet, but in the localities in which it was discovered, it attains a large size, its bright scarlet blossoms rendering it at the same time a very attractive object. The potato experiments maintain their interest, and the magnitude and importance of their results will not be lost, we should imagine, by those whom it will so materially benefit.

The following articles have been the most conspicuous in the exhibitions which have taken place; viz., *Strelitzia regina, Rosa Mundi Camellia, Amaryllis aulica,* and *A. calyptrata, Astrapœa Wallichii,* varieties of *Protea, Sedum*, and *Cyclamen, Crinum amabile, Echeveria gibbiflora, Garrya elliptica,* and a double cone of the Araucaria pine from Chili. The collections of fruit have contained a very handsome black Jamaica pine apple; a shaddock, raised in Lancashire in the open air; citrons, and an orange of much merit, from the open air in Devonshire. Fruit of the fine exotic, the *Averrhoa Bilimbi*; tubers of the *Oxalis crispa,* Easter beurré and *beurré rancé* pears, from standards; Glout Morçeau pears, and specimens of the Chinese pomegranate.

Grafts of the Washington, of Coe's fine late red, of the Reine Claude violette and Nectarine plums, and of the Downton, Knight's early black, Elton, and late Duke cherries, have also been distributed.

CULTURE OF STOCKS (MATHIOLA).

There are more than twenty species of stocks grown by gardeners, besides a great number of varieties, all of which are deserving of cultivation. Some are greenhouse plants; others require the shelter of the frame, and are treated as half-hardy plants, and the remainder are hardy annuals and biennials.

The shrubby greenhouse species, as *tristis, tortulosa, varia,* and *odoratissima,* are of very easy culture. The *tristis* should be potted in light sandy loam, mixed with a little peat, but without any dung. The *tortulosa* thrives best in a soil composed chiefly or altogether of peat; but the *varia* and *odoratissima* require a mixture of sandy peat, light loam, and very rotten dung, in the proportion of equal parts of each. None of the greenhouse kinds are remarkable for showy beauty, nevertheless they well deserve house-room. The *odoratissima* emits a delightful fragrance in the evening, too powerful, however, for a small room; for this reason it is generally known by the name of the "night-scented stock."

These species may be readily increased by cuttings, which strike root very freely, if planted in pots of light soil in March or April, and the pots plunged in a hot-bed frame, or placed under a hand-glass in heat. They will occasionally produce seed, which should be sown in spring.

Of the hardy and half-hardy kinds, those in most repute are the varieties of the annual or ten-week stock, and the Brompton and its varieties.

Culture of the Brompton stock (*M. incana*) is in high repute, and has been for many years. The varieties are purple, white, scarlet, and variegated, often growing in a spike of double flowers eighteen inches long, and the whole plant rarely exceeding two feet in height. To grow and flower it well the following rules may be attended to:—

1. The best way of propagation is by seeds, and unless some little attention be paid to the selection of the seed, double flowers will very rarely be produced. Always collect the seeds from such plants as have semi-double flowers, or which grow in the immediate neighbourhood or are surrounded by double ones; for although double ones have no power to produce seed themselves, and it has been disputed whether they can impregnate others, yet it has been always found that plants raised from seed gathered in such situations have amongst them a greater number of double ones than when the seed-bearing plants grew under different circumstances.

2. The best time for sowing is the beginning of May. This should be done on a border of light sandy soil prepared for the purpose, on an eastern or south-eastern aspect; never on a south aspect, as this would be too hot for them. Of all other modes, the best is to sow the seeds in shallow drills, six inches apart, scattering the seed very thinly.

3. Water as often as they require it, but never do this in the middle of the day;

when the sun is hot, for the plants would be liable to be damaged by the sun, rendering the drops of water hot, and thereby scalding the leaves, which, if it did not entirely destroy them, would greatly retard their growth. The best time is either very early in the morning, or towards five o'clock in the evening, when the sun's rays are oblique.

4. When the plants are nearly three inches high, they should be thinned out to six inches apart in the rows, and afterwards to a foot, taking up every other row; and those plants taken out, should be transplanted carefully into a similar border as that prepared for the seed bed, or be planted three or four together in the flower borders: the former plan is the best, if it is convenient, because the whole are more easily protected through the severity of winter. In either case they must be taken up with balls, and be sheltered from the sun, and regularly watered, until they have begun to grow again. Those left in the seedling bed will be much finer plants in the autumn than the transplanted ones, from the circumstance of having received no check in removing, which, from having so small a quantity of fibrous roots, prevents their growth for some time.

5. On the approach of winter, the borders may either be hooped over, and be covered with mats in severe cutting weather, or a frame may be set over the plants, and the glasses put on to preserve them. If they are left entirely exposed, if the plants are not killed, the long leaves will be beat to pieces by the winds, and the naked stalks, at the approach of spring, will be very unsightly. Those planted in patches in the flower borders may be protected by branches of spruce fir, stuck into the ground round them, in the absence of other shelter.

6. In March, if the weather be fine, or if not early in April, take them up with as large balls as they can be got, and plant them in the situations intended for them in the flower borders. In June they will come into bloom, and will more than repay for all the care taken of them.

Culture of the ten-week Stock (*M. annua*)—is the common annual stock, and derives its name of ten-week stock from the circumstance of its coming into flower about ten weeks after the seed is sown. The species is a most beautiful one, and the varieties are of various colours.

There are usually four or five seasons for sowing the seeds of annual stocks, viz. February, March, April, May, August, and October.

The soil best suited for these kind of stocks is a mixture of light rich sandy loam, taken fresh from the top spit of a pasture, mixed with about one-fourth of good rotten horse dung; sift the dung, and mix it well with the loam after it is well broken. If the loam be strong, mix with it a good portion of clear river sand.

Gather the seed from semi-double flowers, or single plants that grow immediately amongst double ones, for seed gathered judiciously under such circumstances often produces as many as eight or ten double ones out of a dozen seedlings. Although the capability of the double kinds impregnating the single ones has often been disputed, yet it will seldom be found that more than one or two out of a dozen seedlings will prove double, if the seed-bearers are quite detached from the double ones.

MANAGEMENT OF FEBRUARY SOWING.—Sow the seeds in pots or pans, at the same time and in the same manner as the first crop of tender annuals; place the pots in the hotbed and the young plants will soon appear, then gradually inure them to a cooler place, and supply them with air as the weather permits, or they will soon damp off. Care must also be taken not to overwater, or the same results will follow.

As soon as they are large enough to transplant, take them carefully up with as much soil about their roots as can be got, and plant about six in each 48-sized pot, filled with the aforementioned compost. Place them under a hand-glass, or in a frame close shut down, for a few days until they have begun to grow. Afterwards harden them by degrees, and when they begin to show flower, pull up the single ones, and turn the others out of the pots into the open borders.

MARCH SOWING.—The young plants raised at this time are not so liable to damp off as those sown in February. These are usually sown in drills on a slight hot-bed, at the same time and manner as half-hardy annuals; when they are up, and the weather is fine, give plenty of air and finally take off the lights altogether.

When they are little more than an inch high, transplant them with as good balls as they can be got up with. This may either be done in pots, as the last, in the open borders, where they are intended to flower, or on a warm south border of prepared soil; if the nights are cold, it would be well to shelter them with a mat, frame, or anything else convenient, till they have become established. Afterwards pull up the single ones, and remove the others to their appropriate stations with a garden trowel.

APRIL SOWING.—These require less care than the last. A south border of light soil is the most proper situation to sow at this season. Sow in shallow drills, in preference to broadcast. These drills should be about six inches apart, and the seeds should be scattered thinly. When they are an inch and a half high, remove them to their appropriate places in the flower borders, or transplant them on a bed until they show flower; then select the double ones and throw the rest away, except such as are wanted for seed.

MAY SOWING.—The plants raised at this sowing will continue to flower down to Christmas, and indeed will flower again the following spring. The best situation for this season is a border on an east or south-east aspect. A south border would be too hot; also they are more liable to be infested with a small insect which eats holes in the leaves. When they are large enough, plant them in the places appointed for them to flower; after planting shade them from the sun until they begin to grow, and water as often as they require it.

AUGUST SOWING.—The plants raised at this time are intended to stand the winter in frames, and flower very early in the spring. These are usually sown in pots, from the facility afforded in removing them from one situation to another.

The pots selected for this purpose are forty-eights. Place a good drainage of broken potsherds at the bottom; afterwards fill the pots three parts full of the before-mentioned compost, level it, and scatter a few seeds thinly over the soil, and cover them very lightly with fine mould, and place them on a south-east border until they are up.

When they are an inch and a half high, thin them out to about six in a pot; water as often as they require it, until they have advanced some height above the rim of the pots, then lay a little fresh light loam so as to fill up the remainder of the pot to nearly the rim.

In October, as cold weather advances, they must be placed in a frame, where they can be both sheltered from excessive heat and severe frosts. A dry bottom for the pots to stand upon is a great object in preserving them well through the winter. For this purpose prepare the frame as follows:—First place it in a warm situation opposite the south, and fully exposed to the sun; raise it from the ground by laying a brick under each of the front corners, and two bricks under each of the back ones: this will give a good level towards the sun. Then proceed to place all round the outsides of the frame not less than a foot thickness of soil well trodden down, and raised nearly as high as the top. Next prepare the floor on which the pots of plants are to be placed, first by laying a good thickness of lime scraps, and on the top of that about as much coal ashes as when the pots are placed will leave their tops about six or eight inches from the glass. This floor will effectually prevent worms from penetrating, and also add much to the cleanliness of the plants. Elevating the frame also is far preferable to setting it upon the ground, as the frame is not so liable to rot, and the more the plants are raised above the level of the surrounding earth by a thick floor of ashes, &c., the more easily will they be kept from damp.

They will require as much air as the weather will permit to be given; water must be given very cautiously, and then only in fine weather and in the middle of the day, when the lights can be left off to dry up the dampness, or they will be liable to lose their leaves. Mat them down securely at nights in frosty weather.

OCTOBER SOWING.—These are intended to succeed the last. They are sometimes sown in pots, and sometimes in the bed of a hotbed frame; in either cases they require a little bottom heat. Raise a frame with bricks, as for the last, only place four bricks under the two corners at the back of the frame, and two under each of the front corners. Place the soil round the outsides of the frame as recommended for the last, but instead of forming a floor of lime rubbish and ashes, make up a bed of leaves or dung, tread it well down, and place on the top of it about six inches' thickness of ashes, on which place the pots containing the seeds. But if it is thought best to sow the seeds in the bed, it is only necessary to lay about six inches' thickness of light soil instead of ashes. Water sparingly, and give air plentifully through the winter, but secure from frost by mats, &c. Transplant into pots in spring, or otherwise as may be convenient.

SELECT LIST OF ORNAMENTAL CREEPERS,

WITH

REMARKS ON THE SITUATIONS MOST PROPER FOR THEM TO BE PLANTED IN, MANAGEMENT, AND HEIGHT OF GROWTH.

Coming into bloom in January and February.

Cydonia (Pyrus) Japonica	scarlet	flowers.	4 ft.	A spreading shrub, handsome.
Chimonanthus fragrans	yellow red	—	6 ft.	A spreading shrub, very beautiful.
Chimonanthus grandiflorus	yellow red	—	8 ft.	A spreading shrub, very beautiful.

Coming into bloom in March and April.

Atragene Sibirica	white	flowers.	12 ft.	Deciduous twiner, suitable for arbours, &c.
Cydonia Sinensis	white	—	4 ft.	A spreading shrub, handsome.
Corchorus Japonicus	yellow	—	3 ft.	Deciduous, suitable for trellis, to be trained amongst roses.
Lonicera caprifolia	white	—	10 ft.	A good climber for wood scenery.
— — flore rubro	red	—	10 ft.	May be nailed against a wall.
— flexuosa	light red	—	15 ft.	Evergreen shrubby kind, trains well to trellis.
*Magnolia conspicua	white	—	30 ft.	Deciduous tree, requiring a south wall.
Rosa Boursoulti	pink	—	13 ft.	Evergreen twiner, for a south wall.
— Indica	light red	—	20 ft.	All evergreen shrubby kinds; they make a fine show when well mixed, and trained against a south or south-east wall, where they are rather sheltered. The first will thrive in the most exposed situations, but it flowers finer if the place of growth is sheltered from cutting winds.
— — centifolia	purple	—		
— — purpurea	dark purple	—		
— — sub-alba	purple white	—		
— — media	light purple	—		
— — fragrans	light purple	—		
— — alba	white	—		
— odorata	purple white	—	8 ft.	
— — flavescens	light yellow	—	6 ft.	
— semperflorens	red	—	10 ft.	
— Barclayana	purple red	—	6 ft.	

Coming into bloom in May and June.

Atragene Austriaca	blue	flowers.	8 ft.	Deciduous twiner, suitable for arbours, &c.
— Americana	purple	—	15 ft.	
Clematis viornia	purple	—	12 ft.	Deciduous twiner, suitable for rustic work.
— — purpurea	deep purple	—	12 ft.	
*Cobœa scandens	blue	—	20 ft.	An evergreen twiner, should be planted in a warm situation.
Colutea frutescens	orange	—	3 ft.	Evergreen, shrubby kind, requires a warm situation.
Jasminum fruticans	yellow	—	3 ft.	Deciduous shrub, will bear exposure.
Lathyrus grandiflorus	red and purple	—	10 ft.	Perennial deciduous twiner, very hardy.
Lonicera flava	yellow	—	10 ft.	A good climber, deciduous, suitable for trellis.
*Lophospermum erubescens	rosy purple	—	10 ft.	Evergreen twiner, does best in a warm situation, but will flower in one very exposed.
Passiflora lutea	yellow	—	4 ft.	Evergreen, does well against the front of a stove or greenhouse.
— Colvillii	violet red	—	12 ft.	Deciduous, very hardy.
Rosa Banksiæ	white	—	20 ft.	Evergreen twiners, they both require a south wall to grow them to perfection. They do well on trellis, mixed with decid. clematis.
— — lutea	yellow	—	20 ft.	
— ruga	black	—	20 ft.	Deciduous climber.
— sempervirens	white	—	20 ft.	An evergreen trailer, good in rustic work.

Rosa —— (Clare's)	crimson	—	6 ft.	Evergreen, shrubby.
— Grevillii	purple	—	20 ft.	Evergreen twiner, requires a warm situation.
— Roxburghii	light purple	—	13 ft.	Evergreen, trellis against a south wall.
Rose noisette	light purple	—	10 ft.	All evergreen shrubby kinds, must be planted in a light soil and warm situation to do well. They make a fine show on a trellis in front of a house on a south aspect.
— — grandiflora	.	.		
Rosa — Fraseri	.	.		
— — purpurea	dark purple	—		
— — new yellow	yellow	—		
— Longii	red	—		
Glycene frutescens	blue	—	10 ft.	Deciduous, requires a warm situation.
— Sinensis	light blue	—	15 ft.	Deciduous twiner, warm situation.
*Maurandia Barclayana	purple	—	10 ft.	Requires a south wall.
*Rhodochiton volubile	deep purple	—		Should be planted in a warm situation, on a south aspect.

Coming into bloom in July and August.

Ampelopsis quinquefolia	yellow green flowers.		60 ft.	Suitable to hide an old wall in any situation.
— cordata	.	.	20 ft.	Similar to the last.
Aristolochia sipho	yellow brown	—	30 ft.	A curious climber, for a trellis.
Bignonia capreolata	purple	—	15 ft.	Deciduous, calculated for a south wall.
— radicans	orange	—	30 ft.	Deciduous, very showy on a south wall.
*Eccremocarpus scaber	orange red	—	8 ft.	Rather tender, show well on a verandah, where they continue flowering till the frosts come.
— longiflorus	yellow	—		
*Clematis flammula	white	—	20 ft.	Deciduous climber, for trellis, on a south aspect.
— Florida	white	—	10 ft.	Deciduous climber, trellis, or arbours.
— Virginiana	white	—	15 ft.	Deciduous climber, will bear an exposed situation.
— viticella	red	—	20 ft.	Deciduous climbers, well calculated for bowers, arbours, trellis, or any rustic wood work....They all make a good show when in flower.
— — rubra	red	—		
— — cœrulea	blue	—		
— — flore pleno	blue	—		
Jasminum officinale	white	—	15 ft.	Deciduous twiner, good for trellis, or to grow amongst roses.
— revolutum	yellow	—		Evergreen twiner, requires a warm situation.
*Magnolia grandiflora	white	—	20 ft.	Evergreen trees, do best against a south wall, there are many varieties, all fine.
Passiflora cœrulea	blue	—	30 ft.	Deciduous, very hardy, fine for trellis.
— incarnata	rose colour	—	30 ft.	Evergreen, requires a warm situation.
*Tacsonia pinnatistipula	rose coloured	—	30 ft.	Somewhat tender, should be planted in a well sheltered place.
Periploca Græca	purple	—	10 ft.	Very hardy, deciduous.
Rosa Russeliana	light purple	—	20 ft.	Deciduous, fine for the south part of a cottage.
— moschata	white	—	12 ft.	Evergreen trailer, requires a warm situation.
— multiflora platiphylla	purple	—	—	Evergreen, finest wall rose grown.
— nivea	white	—	20 ft.	Deciduous twiner, will bear a somewhat exposed place.

Coming into bloom in September and October.

Clematis cirrhosa	purple	—	12 ft.	Evergreen climber, for trellis in a sheltered situation, or for a rustic arbour.

Those marked with an asterisk will require their roots covering with a little old tar; this is far preferable to litter, looking neater, and not being so liable to be blown away by the wind. Rotten dung is always injurious.

The two species of Cydonia, well known by the names of *Pyrus Japonica* and *Sinensis*, are very handsome. They require planting in a light rich soil, and are easily propagated by layers, in spring, of the previous year's wood, with an incision made on the upper side of the branch. They will also grow from cuttings of the young wood planted under a handglass

The *Chimonanthus fragrans* and *grandiflora,* are both very handsome and delightfully fragrant. They thrive well in any light rich soil, or a mixture of peat and loam. They easily increase by layers; and cuttings of the young wood will also grow if planted in pots of sand, and plunged in a hotbed. If the weather be severe, and the situation in which the plants grow rather exposed, it will be well to shelter the early flowers, by sticking a few evergreen branches in different parts of the plants.

The species of ATRAGENE, are fine showy plants to train over verandahs, and arbours in wood scenery. They love light rich soil, and are easily increased by layers and seeds, sometimes by cuttings of the young and tender shoots.

The CORCHORUS JAPONICUS is very easy of culture, will grow in any soil ; but from the nakedness of the stem, it never covers either a wall or trellis well, but is best planted amongst roses, &c., where its branches may be hid with those of the roses. It is increased either by layers or cuttings.

All the LONICERAS recommended, will grow well in any common garden soil, and are readily increased by cuttings taken off in August or September, and planted under a handglass on an eastern sheltered border.

The MAGNOLIAS require a mixture of loam and peat, being a little tender. A south wall is the most proper place for them. They grow freely by layers put down in the spring. When the young layers are separated, they should be potted in forty-eight-sized pots, and be placed in a frame, until they have begun to grow.

The different kinds of evergreen ROSES will require light rich soil, and may be increased by cuttings. May is the best month for putting them in, but they will grow if put in, and judiciously treated, any time of the year. Plant them in leaf mould and light loam, and place a handglass over them. If planted in spring, let them be put in on a north border; but all the cuttings planted after the end of June, may be planted on a south or south-east border. For other particulars, see on the "Culture of Roses," vol. i. page 138.

The CLEMATIS *viornia,* &c., &c., require the same treatment as that recommended for atragene, and are propagated in the same manner.

The COBŒA SCANDENS should be planted in a warm situation, as it is properly a greenhouse plant, but will do very well out of doors. A light rich soil suits it very well, and it may be increased readily by cuttings planted in pots, and plunged in a hotbed frame. Also by seeds, which are produced plentifully. It grows very rapidly, and being evergreen will soon cover an unsightly object.

The COLUTEA FRUTESCENS will grow well in any common garden soil ; its orange flowers make a very pretty show in June, and it continues flowering more or less till late in the autumn. The best way of propagation is by seeds, which are plentifully produced in bladders.

The different species of JASMINES usually trained against walls, verandahs, &c., may be planted in almost any situations, and almost any soil that is light; but they will grow and flower finely, if the soil be made a little rich by the addition of dung. On trellis in a south aspect I have seen the *J. officinale* fill a situation, fifteen feet high and six feet broad, beautifully. *J. fruticans* is a good one to plant against the front wall of a conservatory or greenhouse.

The hardy species and varieties of PASSIFLORA are delightful plants to train in the front of a house, intermixed with the Glycene and China roses. They love a light rich soil, and may very readily be increased by cuttings. Just before the deciduous kinds commence growing in the spring, it is a good plan to cut them in a little.

The LATHYRUS *grandiflorus* is such a well known plant, that we need only say that a good rich soil suits it, and seeds is the best way of propagation.

The LOPHOSPERMUM ERUBESCENS is a very fine creeper, and deserves growing by every lover of plants. It grows in a light rich soil, and is excellent for verandahs. On the approach of winter it may either be matted up to preserve the stem from frost, or, what we have found better, to cut it down within a few inches of the ground, place a pot over the root, and fill the pot with either old tan or sawdust. Stop up the hole of the pot to prevent the rain from getting in, then place a larger pot over this, which will entirely prevent the frost or rain injuring the roots or remaining stem. When severe weather is over, and on the approach of spring, remove the pots, clear away the sawdust, and replace one empty pot over the stem again until the young shoots begin to grow ; then give air to the plant by propping up the pot on one side, and finally remove it altogether. This system is much neater and, upon the whole, safer than any other we have practised. It is very easily increased by cuttings.

The GLYCENE *frutescens* and *Sinensis* are beautiful plants, particularly the latter. A mixture of loam and peat suits them best. They readily grow from cuttings. Their flower buds are liable to be injured early in spring by the sudden frosts ; to prevent this we would recommend sheltering them with a piece of canvas or netting, such as is used for sheltering wall trees. This should be strained at a suitable distance from the wall, so as not to damage the plant in times of strong winds. If this precaution be used, they will be in flower about the end of April, and will continue flowering till late in the autumn.

The MAURANDIA *Barclayana.*—This beautiful climber has generally been grown as a hardy greenhouse plant, but it appears to be nearly, if not altogether, hardy. A very large one has stood this last winter out of doors at Chatsworth, and seems to have received very little damage. It grows very luxuriantly in summer, and continues flowering until the frosts of winter. It is increased by seeds, which should be sown early in the spring in a hotbed, and afterwards potted into a light rich soil. About the beginning of May these plants may be turned out into the open borders, where they will begin to flower by the end of the month, and by the end of summer will grow so as to cover a space eight or ten feet high and two or three feet broad.

RHODOCHITON VOLUBILE will require the same management as the Lophospermum.

The **Ampelopsis** *quinquefolia* and *cordata* are of easy and rapid growth, well calculated to plant against ruins or unsightly objects, but they are deciduous, and therefore are not a good shelter in winter. They will grow in any soil and situation, and may be readily increased by cuttings under a hand-glass.

Aristolochia *sipho* is suitable for trellis-work in a large shrubbery, or to run up other trees. It is increased by dividing the roots.

Bignonia *capreolata* and *radicans*.—These are strong growing plants, very showy when in flower; they require a good deal of room, particularly the *B. radicans*. Any garden soil will suit them. They may be increased by cuttings of the young wood planted in light soil, and the pots placed in a little heat.

Eccremocarpus *scaber* and *longiflorus*.—These require exactly the same kind of treatment as the *Lophospermum erubescens*.

Periploca *Græca* is handsome, will grow in any common light soil, and is readily increased by layers and cuttings.

ON THE DISEASES OF PLANTS.

BY ROBERT SPITTAL, ESQ.

READ BEFORE THE CALEDONIAN HORTICULTURAL SOCIETY, DEC. 2, 1830. ALSO FIGURES OF SEVERAL KINDS OF MILDEW INFESTING PLANTS.

All plants are more or less subject to disease, and unlike animals so generally possessed of locomotion, and thereby enabled to seek shelter from the storm, plants, fixed to the soil, are compelled to endure unprotected the frequently injurious influence of external circumstances, variations of temperature, the hurricane, and the overwhelming attacks of the lightning.

Pathology of Roots.—From the important relation which the root bears to the rest of the plant, the latter in most cases depending nearly entirely upon it for nourishment, anything which tends to destroy its functions must in a great measure injure the health of the plant, and in cases of extensive injury even cause death.

Wounds of Roots.—The roots of plants may be wounded by instruments used in working the ground, from the attack of subterranean animals, such as moles, rabbits, mice, and a whole host of insects, the last of which injure roots chiefly when in the larva state by devouring the minute rootlets; and when these larvæ occur in great numbers, the fibrils often suffer to a great degree, being either broken by those which undermine for shelter, or eaten by others, and thus the plants are in a great measure deprived of their wonted supply of nourishment.

The fibrils of roots are often broken among plants of the pine tribe by being violently shaken by the wind, &c., and although none of the roots appear above ground, or even the soil seems scarcely broken around them, yet the plants suddenly decay, being deprived of nourishment by the loss of the tender fibres. After wounds of roots, many trees remain apparently stationary in growth for a time; they are engaged, however, in forming roots according to the loss sustained.

The operation of cutting or laying bare roots of trees to force them to become fruitful is only an apparent exception to the foregoing remarks; for the production of fruit in such cases must be considered as the first step towards decay, it depending not so much on a full supply of nourishment as on a state of maturity necessary for the purpose.

Treatment.—When the roots have been attacked by insects endeavour to destroy them. The most approved solution is lime water and tobacco water poured upon the ground over the affected parts; even unslacked lime has been dug in with advantage. To entrap the wireworm (*Elater segetis*) Sir Joseph Banks recommends slices of potatoes to be buried where they abound, frequently examining the baits, and destroying such as have collected on them. When a plant happens to have its roots lacerated, these ought to be protected from extremes of heat and cold; the ground in the neighbourhood should be kept moderately moist; if possible, the plant itself shaded, and whatever else may be found conducive to its health should be resorted to, to induce the formation of new roots.

Gangrene of Roots.—This occurs often, and is of two kinds—wet and dry gangrene. An example of the first kind occurs frequently from too much moisture, accompanied with cold weather and a bad soil, or in consequence of the succulent nature of the parts in which it occurs. It is frequently found in "house plants," when these have been officiously indulged with too much water. Dry gangrene in roots is similar to that in the stems, and is noticed under that head.

Lacerated and incised wounds of Leaves.—These occur from the attacks of animals, chiefly of the insect tribes; from hail; and many of the lower animals are very destructive to the leaves whilst feeding. Some birds seem to do so for amusement. The *Apis centuncularis* cuts out portions of leaves, and carries them away for its use. Plants frequently become stripped of the foliage in a short time by the ravages of the caterpillars, of butterflies, and moths, although, generally, these are more sparing in their attacks. These, with many others, attack most plants fit for the food of man.

Various methods have been had recourse to, for the destruction of caterpillars; washing with tobacco-water and soap, lime-water, &c.: boiling water has also been tried with success; for those insects which seek the ground at particular seasons, unslaked lime laid on and dug in is advantageous.

There is what may be termed an approach to a natural cure for this infection, in the larvæ of an aphidivorous fly which is described and represented by Darwin. The same animal also destroys the caterpillars in great numbers.

Remarks of Mr. Elliott on the subject.—When the foliage is all off the trees and bushes, wash them over with the hand-engine to clear them of decayed leaves; for this purpose any water will do: then stir up the surface of the earth all round their roots, and lay a little hot lime about them to destroy their eggs.

Hail is a frequent cause of wounds in leaves, and to ward off these destructive showers, "paragreles" have been used on the Continent. The most approved kind consists of a pole of wood from thirty to fifty feet long, fixed perpendicularly in the earth, having a brass wire, sharpened at the point, running from two to three inches above the summit down into the ground. These should be planted at the distance of from one to two thousand feet from each other. By their influence on the electric state of the atmosphere, the hail is said to be melted down to snow or rain, the descent of which does comparatively little mischief. It is chiefly in southern climes that these are required.

Plants receiving wounds in their leaves must be protected from extremes of heat and cold, from too much moisture, and altogether treated more carefully than usual, according to the habits of the plants affected.

Punctured wounds of leaves.—Leaves are punctured by various insects for two purposes, *viz.* for the purposes of procuring food, and for oviposition. The most remarkable insects of the first kind is the aphis, which attack the under surface of the leaves and young stems, sucking the sap of the plants by inserting their curious proboscides. From these wounds the leaves become variously distorted in shape, generally assuming a blistered appearance, in consequence of the irritation from the punctures at particular parts; and sometimes several of these diseased portions may he seen rising nearly half-an-inch on the surface of a leaf otherwise healthy; the concavity of these are found to contain numerous aphides. Such distortions are generally of a whitish or reddish colour.

On the leaves of the maple tree, round purple tumours, with narrow necks, are often found projecting from their upper surface, having a small opening leading into them from the under surface, nearly closed, however, by a number of morbidly enlarged hairs: these we believe to be the effects of punctures by the aphis. Small white tufts are often seen attached to the leaves and stems of the larch: these are are produced by a brown aphis, and when examined by the microscope are seen to consist of a bundle of fine filaments, generally twisted around the animal, and attached to the extremities of many: oval-shaped eggs are also frequently seen.

Various methods have been proposed and practised for the destruction of the aphis. The most effectual appears to be fumigation with tobacco-smoke, followed up by washing with lime-water, and finishing by digging the ground around the plants.

Leaves are frequently found traversed by white lines, twisting and running in all directions; they are caused by the larvæ of certain insects, which eat their way through, leaving their excrements behind them in their paths; and so neatly do they perform their work of destruction, that by far the finest dissections we have ever seen were the works of some of these animals. They burrow under the cuticle, and generally confine themselves to the upper surface of the leaf, sometimes to the lower; occasionally, however, both are attacked.

Some insects lay their eggs close to each other on the back of the leaves of certain plants. After a time these become hatched, and the larvæ, each for itself, pierces a small hole immediately above the attachment of the egg from which it came, and, passing through the leaf, arrives at the upper surface, when it commences its mining, covered only with the cuticle: these do not traverse the leaves like the others, but confine themselves to one part. The leaves of apple and pear trees are very subject to this affection.

The treatment of such is not as for the aphis, in consequence of the protection they receive from the cuticle. The most powerful remedy is boiling water.

Wounds of leaves with oviposition.—The most curious effects produced by the wounds of insects, are the various kinds of galls. These are tumours produced on various succulent surfaces, varying according to the insects which affect them, or the plants in which they occur. They are caused by insects of the order *Hymenoptera* and genus *Cynips*, and occur in a variety of plants, but most frequently in the oak and willow. It is very evident that these curious excrescences must materially injure the health of the plants on which they occur, from the inordinate consumption of substance required for their nourishment; and this is found to be the case, for when they occur in great numbers, from the excess of nourishment drawn off, the branch, or even the whole plant suffers, the leaves become distorted and small, and the whole plant stunted in growth.

They scarcely admit of a cure in many plants. The method, however, in the early stage, is the application of boiling water; afterwards, when of considerable size, nothing but their removal will be of service.

Parasitical Plants or Leaves.—Leaves are liable to become attacked by various cryptogamic plants, from circumstances not well ascertained. The most familiar of these diseases is known by the name of "mildew," (*Sporotrichum macrosporum,*) which is at once observable by the white appearance it presents on the leaves. Certain circumstances seem particularly favourable to its appearance, as cold dry weather, and particular exposures; plants under the shade of others, or otherwise shaded, apparently suffering more than those fully exposed.

From microscopical observation, this parasitical plant, constituting "mildew," seems to be composed of globular semi-transparent masses, apparently sometimes attached to a stalk, sometimes to hairs on the plant, or collected into heaps on the surface of leaves and stems.

Amongst the remedies proposed, perhaps the best is thinning around the affected part, or removing to more light and air. Delicate and rare plants may have their leaves washed with water. Lime water has been found of service on apple trees. In hardy plants slightly affected, remove all the diseased leaves or shoots, and attend to the other circumstances mentioned. An apple tree annually affected was perfectly cured by a free washing of what is termed the "cream of lime" during the winter, and the tree appeared very little the worse, having next spring thrown out healthy shoots in abundance, except at the termination of one branch, which passed partly through a currant bush next to it on the wall, and which suffered the usual attack from mildew. From this case we are inclined to think that the seeds of the parasite remain about the buds and stems until a fit period for their evolution.

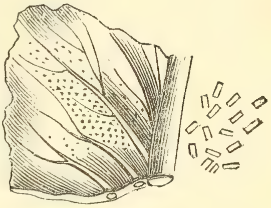
Parasitical plants, apparently of a somewhat similar structure, occur of different colours. There is the red, termed "rubigo, or rust," (*Uredo salicis,*) occurs on the leaves and stems of many plants. There is also a black kind, termed "smut," (*Uredo segetum*). It is most destructive to wheat, oats, &c., which are also very often affected with the red kind.

According to the experiments of Mr. Young on this subject, it appears that the best and simplest method for the prevention of these parasitical diseases in corn is to steep the seeds of affected plants in lime-water for twenty-four hours. When either the black or red parasite appears on other plants, treat them as for mildew. The leaves of several plants belonging to the kitchen-garden, viz. horse radish, cabbage, &c., are sometimes attacked by a parasitical plant (*Uredo candida*), in appearance not much unlike the "mildew" to the naked eye; this disease has been found from experience to be highly infectious.

There is a curious parasitical disease (*Æcidium grossulariæ*) to which the leaves of gooseberry trees are liable. The only remedy for this, and the former disease, known is the removal of the affected leaves, and this can generally be done with safety, these diseases seldom involving many on the same plant at the same time. In this way they will be effectually prevented from spreading to the leaves and plants in the neighbourhood.

Before we leave the subject of mildew and rust on plants, it may not be amiss to introduce a few figures of kinds very common, noticed by Mr. Rennie, Hort. Reg. vol. i. 468, and by Mr. Loudon, and figured Hort. Reg., vol. ii. page 328 *; as first—

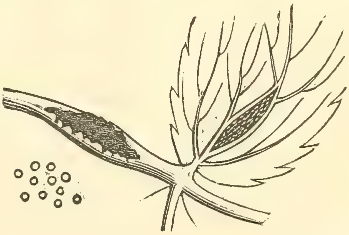
1



The Cabbage Blight (*Cylindrosporium concentricum* (1), which has the appearance of small white patches, or specks of frosty incrustation, which when magnified are found to consist of a number of small cylinders, lying end to end or across each other. These are filled with seed and burst when ripe, scattering it in every direction. Wherever it falls upon the leaf it takes root, and the fungus spreads rapidly.

Rose Blight.—All the *Rosaceæ* are subject to be infested with a fungus having the appearance of a brown powder, which makes its appearance first on the under side of the leaves; this is the *Uredo effusa*, Greville (2). But besides this, there are two other species of fungi found only on rose leaves, the *Puccinia rosæ*, Greville, and the *Uredo rosæ*.

2



Gardeners are well aware that if their dried specimens be placed in damp situations how soon they will become covered with a species of fungi, which when seen through a microscope are found to be little tufts of globules, standing on small stems of the same. This is called the Pencilled Mouldiness (*Aspergillus penicillatus* (3). The specimens are liable to it at all seasons, unless kept properly dry.

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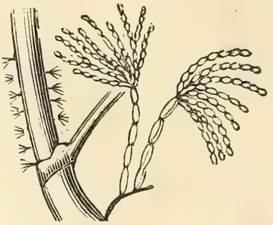
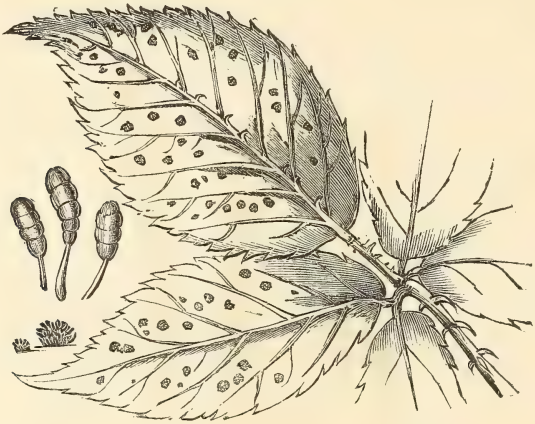
* Figures 1, 2, 3, were extracted from the Gardener's Magazine, vol. ix. page 325, and inserted in our Hort. Reg., vol. ii. page 328, but were omitted being acknowledged.

3



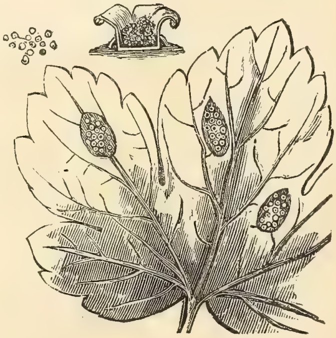
Bramble Blight (*Puccinia rubi*, Decand. (4). This is found only on the bramble leaves; the seed-vessels with four or five cells, not pointed as in the rose blight, and the foot-stalks not so much thickened. There is also on brambles a bright yellow powder; this is another species of fungi the *Uredo ruborum.*

4



(5) Gooseberry Blight (*Æcidium grossulariæ,* Decand.), found only on gooseberry leaves. The upper surface of the leaf opposite the fungus is of a fine red. The seed-vessel splits with an indented border of yellowish white teeth.

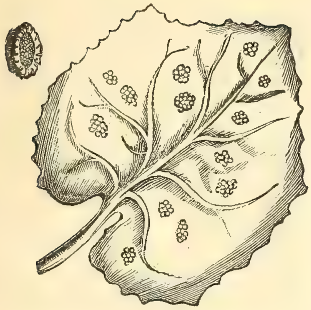
5



(6) Coltsfoot Blight (*Æcidium tussilaginis,* Persoon), found on coltsfoot leaves, and on no other plant or tree. The seed vessel very short, bursting with an indented border of white teeth rolled outwards. The seed pink-orange.

(7) Barberry Blight (*Æcidium berberides,* Persoon), found on barberry leaves or flowers, and on no other plant or tree. The seed-vessel without a foot-stalk, one-celled, and bursting with an indented border, fine orange.

6



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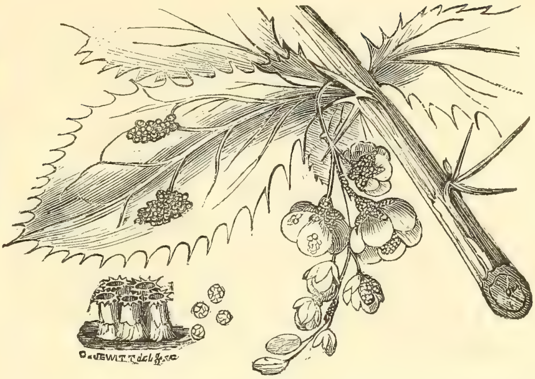
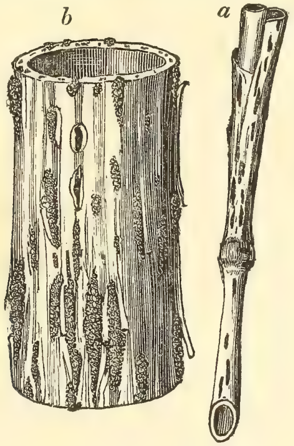
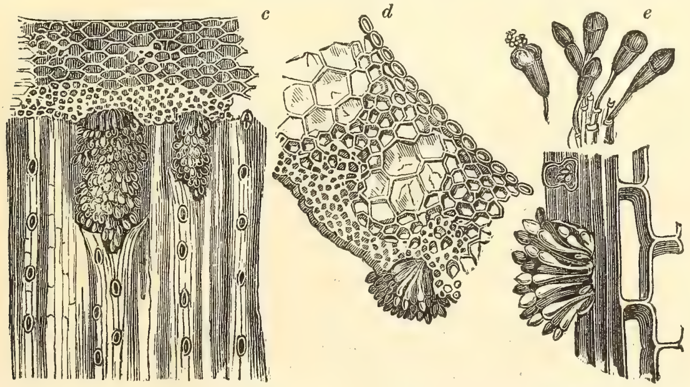


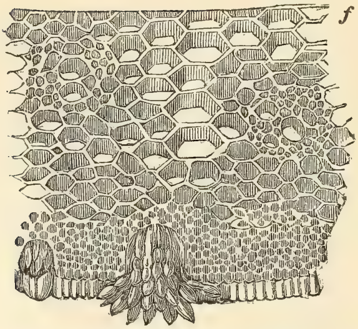
(8) Red Rust of Corn (*Puccinia graminis*, Persoon), found on all grasses, but never on other plants or trees. The seed-vessel with two cells, the upper the shortest, on a thread-shaped foot-stalk. Yellowish-black or brown.

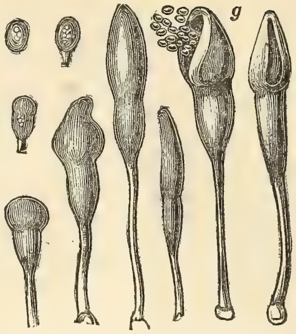


a A piece of wheat-straw with the fungus growing upon it. *b* The same magnified.



c A small portion of the straw magnified. *d* A transverse section of a portion of the sheath of the stem highly magnified. *e* An upright section of the straw highly magnified.





f Transverse section of the straw, highly magnified. *g* The fungus, highly magnified.

Discoloration of Leaves.—Upon certain laws which regulate the proportion of acid and alkaline matter depend the colours of the leaves of plants, and these we know to be as various as the shades in the rainbow. There appears to be a certain proportion of these matters, however, allotted to each, a deviation from which generally more or less injures the health of the plant.

The most usual colour of leaves is green in various shades, but they exist also of different shades of purple, &c. The most usual morbid change of colour in leaves is from green to white, either of the whole or only of part of a leaf, the white portions generally running in longitudinal stripes, sometimes dotted or quite irregular in distribution, at other times around the edges of its leaves only.

Mr. Knight has observed that plants with white leaves cannot survive long, and that variegated plants bear the deprivation of light ill, but he believes there are many such which are neither in a state of disease nor debility. This indeed seems to be the case with some, but there are very few which will not be found to suffer in various degrees from the variegation.

Morbid discoloration of leaves happens from various causes, which counteract the natural influence of light on the leaves, and it may ultimately be in consequence of the obliteration of the pores, or "culs de sac," according to Mr. Todd Thomson, by which respiration is performed. In such cases the blanched portions may obtain a quantity of carbonic acid, from that absorbed by the green portion of the leaf; but when all is white, the acid, it is possible, may be obtained by the roots or stems. However, it is agreed that it is from the accumulation of carbonic acid which takes place, such portions of leaves being unable to decompose it, that the change of colour happens, and which, indeed, seems to vary according to the excess of acid present. Plants, in such a state, are feeble in proportion to the extent of change produced. They lose their odour, taste and inflammability, and the juices are said to be nearly the same in all; but these particular properties may often be restored by a removal of the causes when known.

A want of proper nourishment is a frequent cause of discoloration in leaves; also absence of light, and attacks of insects, as in the white and red tumours of the aphis; again, from the destruction of roots or other vital parts; and, indeed, any thing which tends to injure the health of the plant generally, is apt to produce discoloration of the leaves.

Gangrene of Leaves.—All the diseases of leaves described are apt to cause gangrene, either in the whole, or a portion of the leaf. When such is the case, the leaf first becomes yellow, then brown, sometimes black; and if the plant possesses sufficient vital energy, the affected portion or leaf is thrown off, a separation having taken place between the dead and living parts.

Wounds of the Stem.—The stem is very subject to wounds of various kinds, according to the nature of the instrument by which they are inflicted, and the particular texture involved. Wounds which penetrate or remove a portion of the bark are very common, either from accident or intentionally, as for the cure of some diseases, or as in pruning. Such wounds, and indeed all wounds of the stem, heal the quicker the more vigorous the branch or plant is in which they occur, and of course according to their dimensions. When of great extent, many years may be required for the process.

All wounds heal more rapidly from above downwards than in any other way, no doubt stimulated by the returning juices. The most serious wounds of the bark are those which detach it to a great extent all round the stem; for the consequence is, that all branches beyond the wound are forced to become fruitful, and thus premature decay is brought on.

Simple incised wounds, and even those in which the bark is raised from the stem a considerable extent, may unite, if the edges be accurately adapted to each other, and the whole covered with some plaster to exclude the air, keep out too much moisture, and prevent insects from ovipositing in the wounded part. Forsyth's preparation for this purpose is perhaps one of the best.

In pruning, numerous wounds are necessarily inflicted; these, however, when smoothly and properly made, produce no mischief. Such wounds heal in the same way as those simply of the bark. From experiment, very little injury appears to occur from cutting down and removing the pith in twigs of any age short of the most recent. They, however, cannot bear the mid-day sun so well afterwards.

Stems bruised or fractured even more than half way through, in many cases, will recover; but when more than that it is generally better to remove them at once, especially in old plants, as in such cases there is almost no chance of recovery. There are many plants which never recover even slight fractures, but gradually decay.

Many succulent stems will suffer themselves to be bruised and broken to a great extent, and yet, by proper management, will recover. The most proper treatment for fractured or bruised stems is to tie them up, bringing the edges of the wound neatly together to promote a union, and covering the whole with some plaster. In this way many fractures unite, and bruises become consolidated.

Wounds of Stems from Insects.—There is a minute insect, which frequently infests the stems of apple and pear trees; it is probably the *Coccus arborum* of Reaumur. It attacks all the stems indiscriminately, which in consequence become covered with numerous muscle-like bodies, varying in length from one-eighth to three-sixteenths of an inch. The trees suffer from these, when numerous, by their inducing disease in the bark from the lodgment of water, which they cause, and also by hindering the functions of the bark.

The most effectual remedies for this affection are boiling water, as recommended by Mr. Beattie, in the Mem. Hort. Soc. of Edinburgh for 1827, and the "cream of lime," applied with care to the stems; or they may be scraped off, and the stems afterwards well washed with lime-water.

Many insects attack the woody parts of plants, and trees in consequence become hollow: sometimes, again, the larvæ of some insects curiously undermine the bark of various trees, living upon the liber and alburnum, and forming twisted paths running in all directions. What may be a cure for this last affection is unknown; but if it be usual for the animals to enter in by wounds, the application of some plaster over these might be beneficial.

Ulcerations of Stems or Canker.—Rough, brown, irregular surfaces, sometimes excavated, are often seen on the woody stems of plants. These are portions which have assumed the character of sloughing ulcers. These ulcerations generally go on increasing in size; sometimes, however, by the efforts of the plant, a stop is put to the disease, and the part heals in the same way as wounds do.

There is reason to believe that this disease usually commences in the liber, and its first appearance is indicated by a reddish-brown spot, circumscribed, generally slightly depressed, possessing more moisture than the surrounding parts: and in the centre, decomposition is usually indicated by a commencement of putrefaction. The disease spreads in all directions, involving all textures; generally, it soon comes to the surface, and may at first be known by the falling in of the bark, from the loss of substance beneath by decomposition. The bark becomes opened out in its texture, and of a brown colour, and generally portions fall off in a decayed state as the disease proceeds, leaving sometimes large open surfaces, with rough edges of decayed bark, to become aggravated by external circumstances, and most particularly of insects.

So various, and so opposite, are the opinions concerning the cause of this disease, that it is difficult, if not impossible, to discover the real one. Of eleven authors, the following table will show the various causes mentioned, and the number of supporters each opinion has:—

Supporters.	
8.	Wounds of the bark and wood.
8.	Bad soil and sub-soil, viz. wet—stiff clayey—cold clayey—cold wet—wet gravel—exhausted soils—mossy bottom.
4.	Injudicious pruning.
3.	Bruises.
2.	Gangrene of young shoots.
2.	Attacks of insects.
2.	Cold, wet seasons.
2.	Improper aspects.
1.	Load of fruit.
1.	Frost injuring sap.
1.	Friction.

Removal of the affected part by the knife, and covering the wound with plaster, as recommended by Forsyth, is the most usual method by which a cure is attempted and this, in some cases, seems to answer tolerably well, while in others it entirely fails.

Gangrene of Stems.—The disease just described is frequently the cause of extensive gangrene, by which we mean, that the part loses entirely its vitality, and is, in many cases, changed in its consistency, having its texture completely broken up. In all cases the colour is changed, and generally to a reddish brown or black; but the texture is not always broken up. Gangrene seems to occur, for the most part, in consequence of wounds, parasitical plants, great heat or cold, excess or want of moisture, lightning, &c.

Extremes of heat and cold, and sudden alteration of temperature, are frequent causes of gangrene in succulent stems and other parts of plants, as the leaves, flowers, &c.; and the hopes of the gardener are often blasted by their influence, especially in spring.

The cherry, plum, and other stone-fruit trees, are subject to a species of gangrene, which is generally called the "Gum," from the gummy effusion which frequently issues from the affected stems. The affected branches must be removed as soon as possible. The disease is very rapid in its progress.

Stems sometimes become bark-bound, and this is supposed to arise from the cuticle not giving way as it ought to do; trees in consequence become stunted in growth. It is sometimes cured by longitudinal incisions along the stems down to the alburnum.

Natural Decay of Plants.—Plants, like all other organised bodies, are destined to exist but for a time; some for less than a day, others for more than a thousand years; but all are subject at last to decay. Each having certain functions to perform, that the continuation of the species may be insured, natural decay never comes on till this process is completed, and the period specified varies in almost every different species.

Many plants, after having produced seeds but once, die; others again are permitted to perform this process from year to year; but in these there is, at particular periods, a decay of the temporary organs, and after a time they, too, come under the influence of that general law which all organised bodies are forced to obey.

In considering the methods to be pursued to counteract natural decay, we must keep in mind, that plants, for the most part, decay in the same ratio that they come to perfection; and, therefore, whatever means are to be employed, they must be practised with a constant reference to that fact, that it is not until after the plant has become fit to re-produce its species that natural decay appears; from which it is obvious, that the only means to be employed, are such as will prevent the plant from attaining that particular period.

OPERATIONS FOR MARCH.

Anemones now planted will flower by the middle of June, and will come into bloom soon after those planted last month, page 17, rules 2 and 3.

Anomatheca cruenta potted last month will now require a good supply of water. Vol. i. p. 103.

Adenandra.—The greater part of the species may now be propagated by cuttings of the young wood. Vol. ii. page 24.

Asclepias.—*Tuberosa* and other species may be increased, page 26.

Banksias.—Be careful not to allow the soil in the pots of Banksias to become too dry, for the plants rarely recover if such is the case. Vol. i. p. 120.

Brachysema latifolia may still be layered, page 24.

Calandrinia speciosa and other kinds may now be propagated by seeds. Vol. i. p. 222.

Calceolarias.—All the annual species should now be sown, page 24.

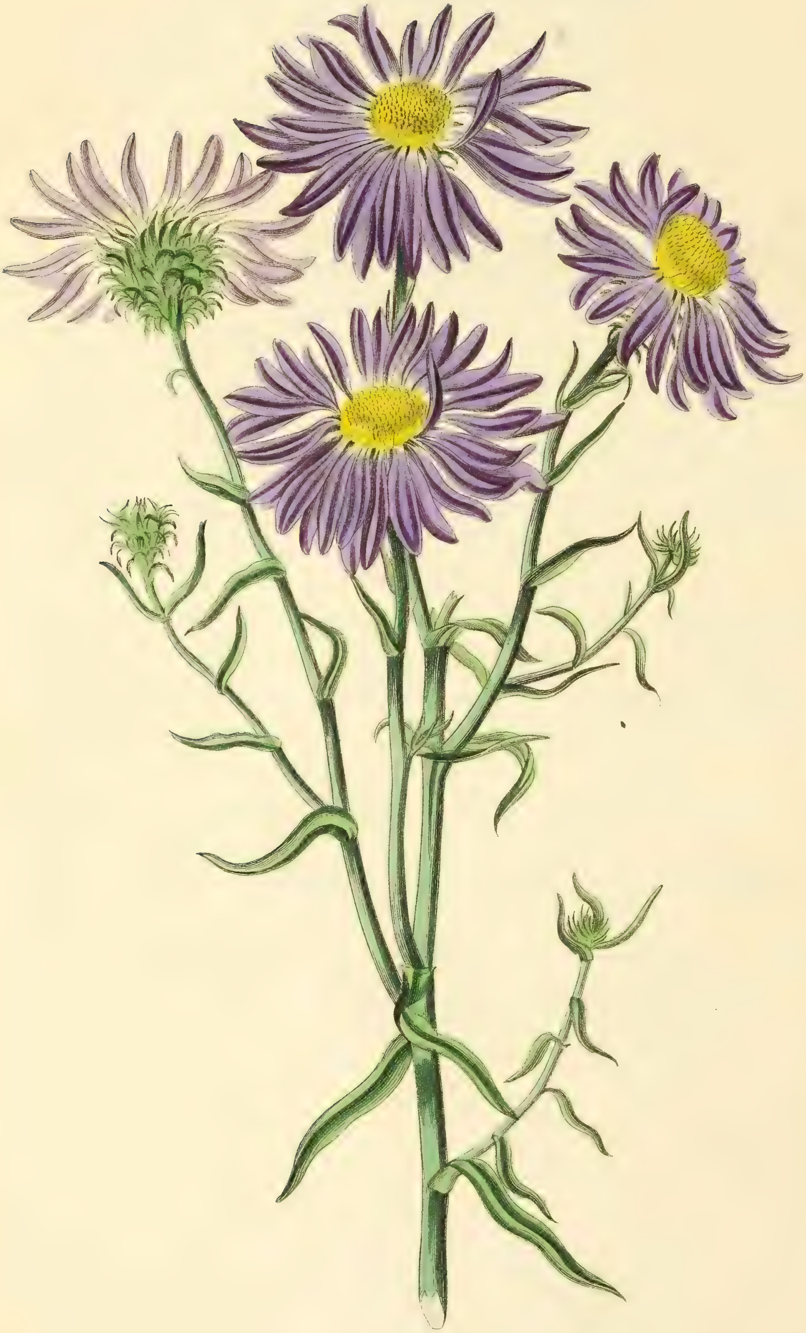
Cyclamen persicum.—As the flowers advance give them a good supply of water. Vol. i. p. 180.

Francoa.—All the species may now be propagated by division, and seeds may be sown. Vol. i. p. 235.

Ribes sanguineum should be propagated by cuttings without delay. Vol. i. p. 3.

Rhodochiton volubile may now be propagated by cuttings, page 27.

Stocks.—A crop should now be sown to succeed those sown in February, page 33.



F.W. Smith del et sc.

Diplopappus canescens

DIPLOPAPPUS INCANUS.

(HOARY DIPLOPAPPUS.)

CLASS.
SYNGENESIA.

ORDER.
SUPERFLUA.

NATURAL ORDER.
COMPOSITÆ.

GENERIC CHARACTER.—*Calyx* imbricate; *florets of the disk* tubular, five-cleft; *florets of the ray* three-cleft, ligulate, including both yellow and purple flowers. *Pappus*, or down, in a double row; *seeds* obovate; *receptacle* naked.

SPECIFIC CHARACTER.—A hardy perennial, somewhat of a half shrubby habit, branching; both stems and leaves covered with a short, soft, downiness. *Leaves* linear, entire, from half an inch to an inch long. *Flowers* terminal. *Calyx* scales numerous, linear, covered with glandular hairs. *Rays* purple, consisting of many florets. *Disk* bright yellow.

THIS genus so nearly resembles *Aster* that its chief distinction appears to be the double row of down (*pappus*). It is a native of California, where it was discovered by Mr. David Douglas, and seeds of it sent to the London Horticultural Society's gardens, in 1832.

It will most likely bear the open air of this country as well as the asters, and it is found to thrive well in open exposed situations, and continues flowering until the approach of winter. The plant whence our drawing was taken, had been sheltered in a frame during winter. Any common rich soil will answer for it, and it is propagated by division of the roots.

CHELONE CENTRANTHIFOLIUM.

(VALERIAN-LEAVED CHELONE.)

CLASS.		ORDER.
DIDYNAMIA.		ANGIOSPERMIA.

NATURAL ORDER.

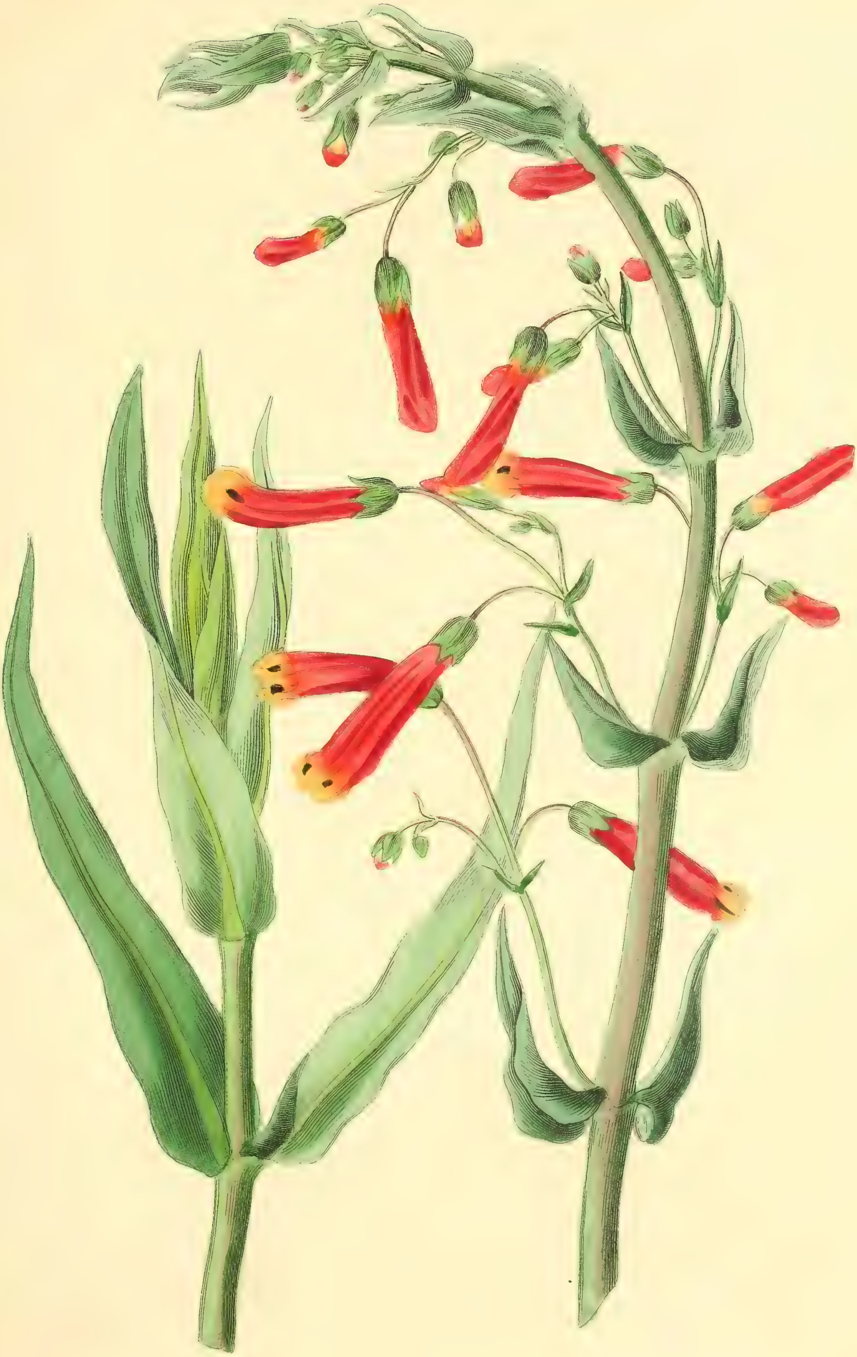
SCROPHULARINEÆ.

GENERIC CHARACTER.—*Calyx* five-parted. *Corolla* gaping. *Capsule* two-celled, two-valved. *Seeds* many.

SPECIFIC CHARACTER.—A perennial, growing to seven feet high. *Leaves* betwixt ovate and lanceolate, blunt at the point, smooth, and somewhat shining. *Flowers* growing in a panicle. *Panicle* slender and long, forming the upper part of the stem. *Calyx* bluish green, five-parted. *Corolla* tubular, slightly inflated, somewhat funnel-shaped, bright orange-scarlet, limb two-lipped, upper lip divided into two parts, lower one into three; free from the beard at the mouth possessed by the *C. barbata,* in other respects bearing some resemblance to it.

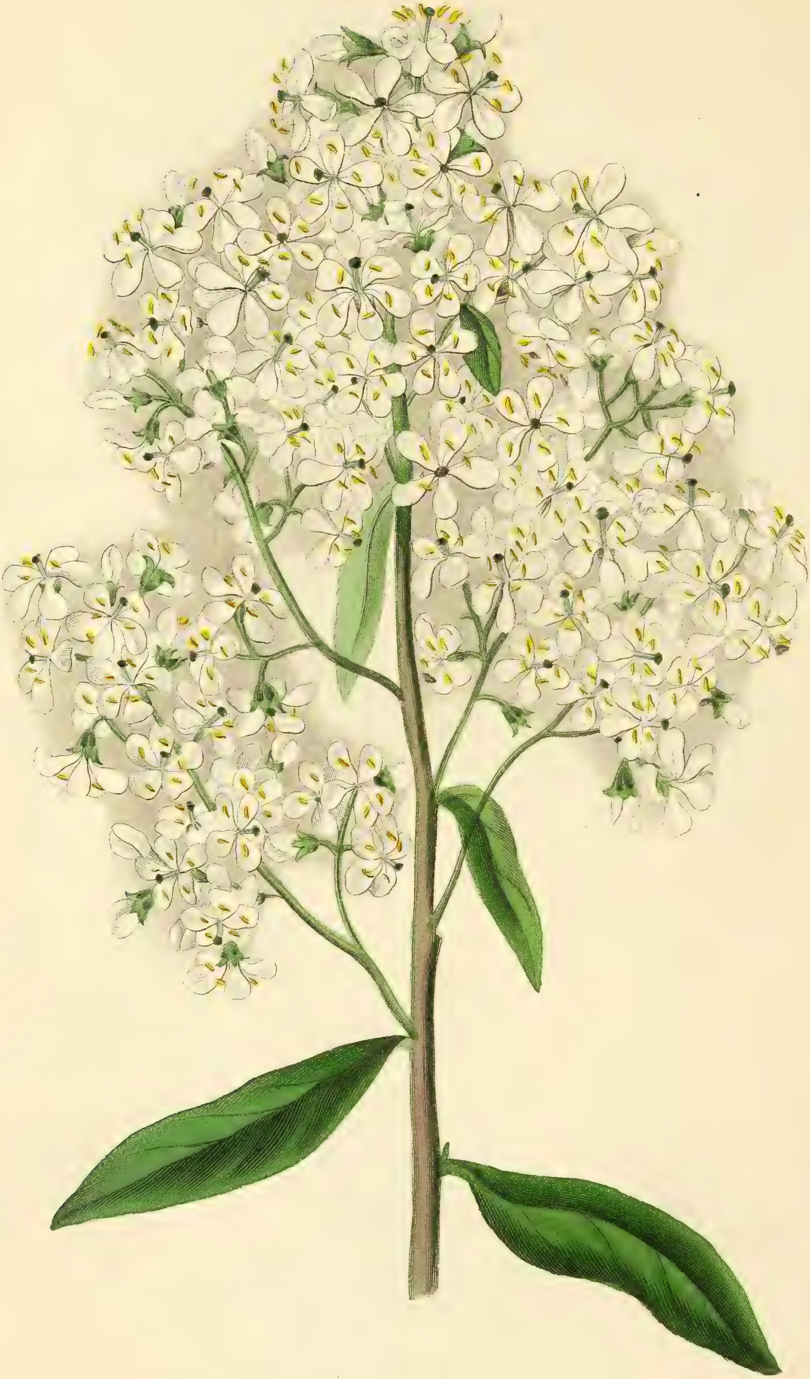
THIS new hardy herbaceous plant is a native of California, from whence it has been introduced by Mr. David Douglas. It looks very handsome when growing amongst bushy plants, and may be planted in almost any light soil, if the situation be not too exposed. The plant from which our drawing was taken grew and flowered well.

All the species may be easily propagated by cuttings, and slips from the roots, and this kind bears plenty of seeds.



F. W. Smith. del et s.

Chelone cheilanthifolium.



F. W. Smith. del. et sc.

Escallonia montevidensis

ESCALLONIA MONTEVIDENSIS.

(MONTEVIDEO ESCALLONIA.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
ESCALLONIÆ.

GENERIC CHARACTER.—*Calyx* five-leaved. *Petals* five, connected in a tube. *Capsule* many seeded.

SPECIFIC CHARACTER.—A shrub, *branches* growing erect. *Leaves* oblong, serrated. *Panicles* terminal, many flowered, with bracteal leaves intermixed. *Calyx* five-leaved, acute. *Petals* white and delicate.

THIS greenhouse plant is said to be common at Montevideo, where it was discovered by Mr. Sellow, and introduced in 1827.

The plant will grow upwards of eight feet high, or probably more. Many panicles of flowers are produced, which emit a powerful fragrance. It will do well in the open air during summer, planted in sandy loam and peat, but will usually perish in winter if not brought into a greenhouse or other shelter. It is propagated by cuttings, which should be planted in light soil, and have a handglass placed over them.

LOBELIA FULGENS (*Var.* PROPINQUA).

(A NEW NEARLY RELATED VARIETY OF THE FULGENT LOBELIA FLOWER.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LOBELIACEÆ.

GENERIC CHARACTER.—*Calyx* of five teeth. *Corolla* tubular, irregular, cleft from the top of the tube, into long divisions. *Stamens* having the anthers united and bearded. *Style* simple. *Capsule* two-celled, dissepiments bearing the placenta.

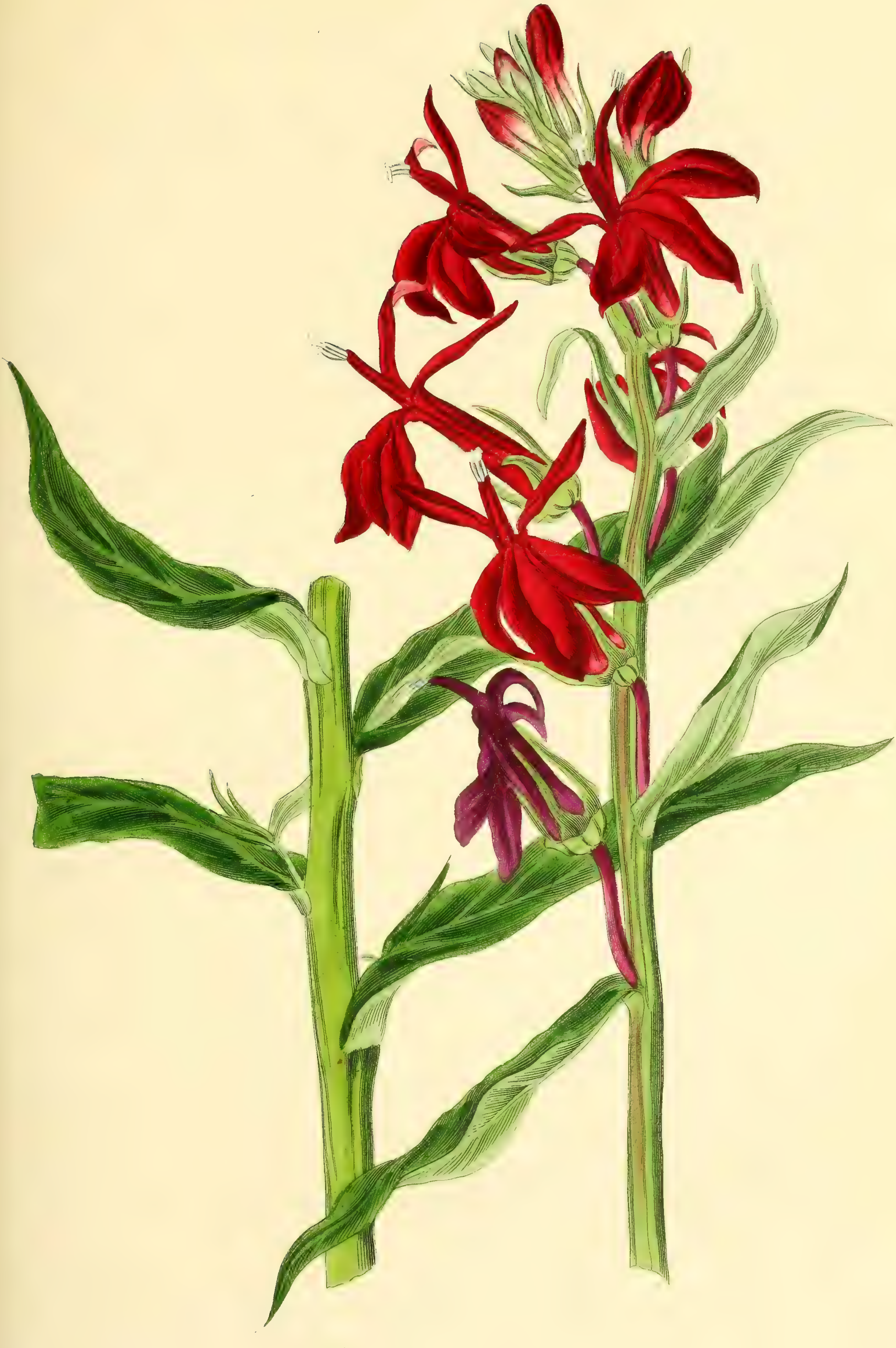
SPECIFIC CHARACTER.—*Stems* erect, and of a dark red colour. *Leaves* sitting, obovate, slightly serrated, margins undulated, greenish purple when young, ultimately light red. *Flowers* in a long spike, colour bright scarlet.

THIS fine hybrid variety of Lobelia was raised from seeds of the *L. fulgens* impregnated with the pollen of *L. splendens.* It partakes of the character of both parents; but is much superior to either in manner of growth and general habit. The spikes measure from two and a half to three feet in height, forming elegant pyramids.

This variety succeeds well under the ordinary treatment required by the other Mexican and Cape of Good Hope species; that is, planted in light rich earth in summer in the open air, and given the protection of a frame in winter. They are increased by suckers or seeds.

Our drawing was taken in the nursery of Messrs. C. J. and P. Young of Epsom, where it was growing luxuriantly in beds, and aggregately forming a magnificent spectacle.

This fine genus of ornamental plants received its name in honour of M. Lobel, a celebrated botanist and physician, who died in 1616. Linnæus included the Lobelia in his nineteenth class, *Syngenesia,* and order *Monogamia;* because the flowers are simple, but with united anthers. This order, however, is now abolished, and transferred to the class and order as above. It gives a title to the natural order *Lobeliaceæ,* and is there associated with four other genera. The old cardinal flower, *L. cardinalis,* or *Chapeau rouge* of the French gardeners, is a favourite everywhere.



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Lobelia propinqua.

GENERAL CULTURE OF STOVE PLANTS; WITH A FEW MORE REMARKS ON HEATING HOT-HOUSES.

1. Nearly all stove plants are easy of culture, although some possess peculiarities, which are necessary to be attended to for their successful management.

2. All stove plants being natives of the countries within the tropics, require as much heat as bears some resemblance to the climate where they naturally grow.

3. The house intended for their growth, should therefore be so constructed as to give a good command of heat in the winter, when no outward helps are afforded.

4. Never allow the heat to sink below 60 in a plant stove, or for general culture rise above 80 degrees, but rather endeavour to keep the thermometer as near 70 degrees as it can stand; although some plants will bear a much greater heat than 80 degrees, provided humidity attends it *.

5. On sunny days, when the glass has risen to 75 degrees, give air; the best situations for admitting it, is either through ventilators in the back or front walls, or by drawing down the back lights; but never give air at the doors, or in situations by which a regular draught of air would pass through the house, for this would dry the soil in the pots too much, and injure the young growing shoots.

6. Never plunge the plants in beds of tan, a system which was formerly much practised, but now nearly, or altogether exploded *, because they are not found to thrive nearly so well as when placed on the surface of a prepared floor of some kind.

7. In winter when the plants are not in a growing state, the heat may be kept from 60 to 65 degrees, which will give them a kind of hybernation, but in February when the plants are potted, increase the heat and start them growing.

8. During the decrease of heat be careful not to over water, or keep the house damp, or the plants, in the dark months of November, December, and January, are liable to receive injury.

9. Stove plants are of two kinds, viz; dry stove plants, and damp stove plants; the general treatment of these is somewhat different, The dry stove plants include all such kinds as are succulent, and which, in their native countries, grow in dry and in most cases exposed situations, where they seldom obtain any moisture. The other kinds require a humid atmosphere, and a good supply of water to their roots, when in a growing state; varying, however, in different plants according to their nature and habits.

10. *Dry stove plants.*—These may be divided into two kinds.—First, those having a very fleshy texture, and a shrubby habit, requiring water very seldom, and then only in small quantities.—Second, herbaceous or tuberous rooted plants, which

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* Orchideous plants will bear a great heat, if attended with excessive humidity; these are not included in the present remarks.

† It must be remembered that this rule stands as a general one, but there are exceptions to it, some plants scarcely thriving without being plunged in bottom heat.

during the time of flowering require a liberal supply of water to their roots, but sometimes perish if the atmosphere be very humid, and at all other seasons except at the times of flowering, require nearly the same treatment as the first kind.

11. The *first* kind includes the stove species of *Cacti, Euphorbia, Mesembryanthemum,* &c., &c. Particulars of culture cannot be detailed here, as every genus differs more or less in habit, and so the culture must more or less vary: but as a general rule, all the *Cacti, Euphorbia,* and plants of that kind, should be potted in loam and peat, or sandy loam alone, and have about a fourth part of lime rubbish added to it; and in other respects should be treated as recommended vol. 1. page 49. The *Mesembryanthemum, Crassula,* &c., require to be potted in a good rich, light soil, and will bear a greater supply of water than the other. The manner of propagation is much the same in both:—the cuttings striking best when the wound made by the knife or other means in separating is dried up and healed.

12. The second kind includes the plants like *Gesneria, Gloxinia,* &c. The best soil for these is sandy loam and peat, with a little very rotten dung mixed. At the season of full growth, they will bear a good supply of water, but after flowering they should be moved into a cooler situation, and have a small portion given to them for a week or two: afterwards keep them quite dry, till the tops have died down; let them remain so until nearly the time for starting again, then cut off the tops, shake the roots from the soil, and plant each strong one singly in a pot, and the smaller ones two or three in a pot, filled with the above compost, and place them in the stove again. They are propagated by cuttings and single leaves, which may be planted either in sand or mould, plunged, and be covered with a bell glass. Some of them also produce seeds.

13. *Damp stove plants.*—The many genera coming under this head require a little variation in their treatment, arising from the habits and peculiarities of each; yet the general course of management is much the same in all.

14. The soil best suited for their growth is composed of light sandy loam, (the top spit from a pasture,) leaf mould. and peat, in the proportion of one half of the former, to one fourth of each of the latter, which should be thrown together from three to six months before using, that the turf may be well rotted.

15. This soil should not be sifted previous to using, but be well broken to pieces; for sifting, though necessary in some cases of plant culture, will not suit plants in general, for, by removing the fibrous particles from the soil, it is apt to set hard in the pots, and become uncongenial for the growth of the tender roots.

16. The usual times of potting are from the middle of March to the middle of April, and from the beginning to the end of September. But the best plan is to constantly look through the plants, and repot all that require it, at any time; for if the roots once become matted in the pots, the plants receive a check in their growth, from which they will require some time to recover.

17. In potting, always give a good drainage with broken pots, for although many plants require a liberal supply of water, yet stagnation is generally injurious. To prevent the soil from washing into the broken pots at the bottom, lay immediately over them a little of the fibrous portion of the soil.

18. Hard-baked pots are always injurious, and should, therefore, never be used;

nor should any slender-growing plants be placed in too large pots: as a general rule, a slender-growing plant will thrive better somewhat cramped at the roots, than when over-potted. Strong growing plants require more room for their roots, and seldom suffer from the size of the pots, provided other circumstances agree.

19. During the hot months of summer the plants must be well supplied with water, and if they are syringed over head, not less than three times a week, in hot, dry weather, and once a week at all seasons of the year (except the months of November, December, and January), it will keep them clean, and greatly conduce to their health. It is also necessary that the air of the house should be kept constantly more or less humid, this may be accomplished by throwing water on the walks and flues of the house; of course this must be done with caution, and but seldom in the depth of winter, but at all other times it may be done every day.

Propagation.—The methods of propagation are by cuttings, layers, suckers, seeds, and division of the roots.

20. *Cuttings.*—No period can be definitely fixed for planting the cuttings of the different genera; this must always be left to the judgment of the cultivator. Some plants propagate freely by cuttings of the young and tender wood, as *Melastoma,* or *Barleria, Astrapœa, Inga,* &c.; others, when the wood begins to assume a brownish colour, or is half ripened, as *Ixora, Bauhinia, Passiflora, Ruellia,* &c.; whilst others will only strike freely when the wood is perfectly ripe, as *Grevillea, Blakea, Cheirostemon, Achania,* &c., but, as a general rule, the season lasts from January to August.

21. All hard-wooded kinds make roots best in clear sand, but soft-wooded kinds require to be planted in light soil. After properly draining the pots, fill them with sand or soil according to the kinds intended to be propagated. On no account mix soft-wooded and hard-wooded kinds together in the same pot.

22. If a hot-bed frame can be appropriated to the purpose of striking the cuttings, so much the better; but if not, place them in a damp, shady part of the stove: in either place they require to be sheltered from the rays of the sun, until they have struck root.

23. Care is requisite in removing the leaves from the lower ends of the cuttings, that the bark be in no wise injured; never take off more leaves than are necessary for the insertion of the cutting, nor mutilate or shorten the remaining ones.

24. After the cuttings are put in, a gentle sprinkling of water may be given through a fine rose, to settle the soil about them; after which they may be placed in the situations where they are to strike, and be closely covered by glasses from the air, until they have begun to grow, when they may receive a little air. Water must be administered with caution.

25. When struck, pot them off into small pots filled with light sandy loam and leaf mould, replace them in the frame until they have begun to grow, then gradually expose them to a more gentle temperature, and finally remove them to the stove and treat them as old plants.

26. *Layers.*—Many sorts also strike well by layers, as *Combretum,* &c., &c., this is performed when the wood is half ripe; make an incision on the upper surface of

the branch, and slightly twist it until the cut part lodges on the soil, peg it down, and cover it over with the mould.

27. *Suckers.*—Many kinds are propagated this way, as *Tillandsia, Agave, Tacca, Strelitzia,* &c., &c. The only caution necessary to be given on this subject, is, not to remove the suckers until they have made good roots. They may be separated and treated as old plants.

28. *Seeds.* — The proper time for sowing the seeds is in February and March, but when they have been received from abroad, the best way is to sow them directly, let it be what time of the year it may. We use a gentle hot-bed, and have been pretty successful in bringing up most that have reached us.

Care must be taken not to over-water the pots in which the seeds are sown, nor allow them to become on the other hand parched with drought. A good plan is to cover the pots with a little moss, which will greatly facilitate their growth by keeping the soil somewhat damp.

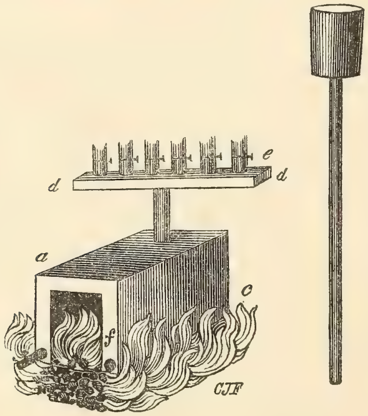
29. When the seedlings are sufficiently large, transplant them into thimble pots, carefully raising each with as much soil about the roots as possible.

30. After the young plants are potted, replace them in a gentle hot-bed, and shade them until until they begin to grow; then give them a little air daily, and finally remove them to the stove, and treat them as the old plants.

31. All those which grow up spindling and weak, may be improved by pinching off the tops: this will induce them to throw out side shoots and become bushy plants.

32. *Division of the roots.*—The *Orchideæ,* and many other kinds, are propagated by this plan. All that is required, is to do it carefully, so as not to mutilate the roots of tender plants more than is necessary, and after potting the divided parts, to be careful not to supply with much water, until the wound has healed, or the roots are liable to rot.

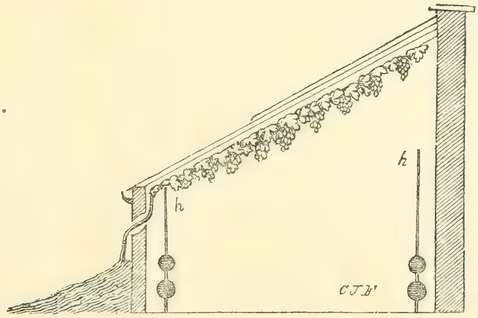
Thus much for the culture of the stove plants at this time; we shall now resume the subject of heating hot-houses, which we commenced vol. i. p. 130. Our readers may remember that we recommended common flues to be used for greenhouses,



because of the small portion of artificial heat required for them, but in plant stoves hot water pipes may be used with great advantage. A system of heating by hot water was furnished us some time ago by Mr. Waldron, which probably might answer well. This apparatus is so simple that when the pipes are obtained, any person may without difficulty fix them. The boiler *a*, is three feet long, two feet six inches wide, and two feet six inches deep down the sides. The fire is made in the middle *b*, and leaves but six inches depth of water over it; the water coming down each side of body of fire, and the flames also spreading around the outside *c, c,* soon causes the water to boil; the fire-place is one foot six inches wide, and three feet long; and from the great body of fire it will contain, the boiler is capable of answering the purposes of several houses; and the fire when once got into full action consumes comparatively little fuel. On the top of the boiler is fixed a box *d*, from which issue as many pipes as there are houses to be heated, allowing one pipe to each house. Each of these pipes has a stopcock at its base, *e*, to turn the water and heat on or off any house required. A similar box is fixed at *f*, for the return pipes, and on the top of it is fixed a feeding pipe *g*, to allow the air to escape from the circulating pipes, and also to supply the boiler with water; the size of the feeding pipe must be regulated by the quantity of water the boiler and pipes hold; every twenty gallons, when hot, become twenty one by expansion; for every twenty gallons, therefore, the boiler and pipes hold, one gallon must be allowed for the feeder: for instance, if the boiler and pipes hold 160 gallons, the feeding pipe must hold eight, to allow for expansion.

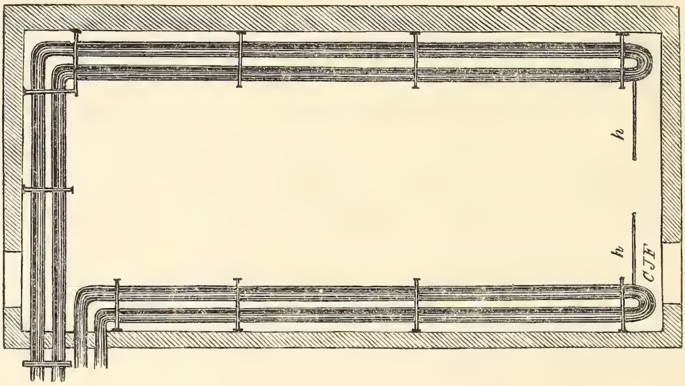
There are two small pipes (fig. 113, *h,h,*) of half an inch bore placed upon the top pipes at the turning, to carry off the air, that the water may circulate freely. These are carried up from four to six feet high, and if placed against the wall, will not be much seen; if the pipes have to pass a door-way, they may be sunk under the walk, and raised again after the manner of a flue; but previous to sinking them a small pipe, similar to *h,h,* must be fixed to carry off the air, or they will not work well off from the boiler and pipes when required. The boiler is a close one, and should be well made, and put together with fire cement, nuts and bolts; it will cost about twenty shillings per cwt.

Fig. 113.



If the boiler is only intended to heat one house, the boxes will not be wanted, as a pipe will be fixed on the top of the boiler, and the return one at *f*, exclusive of the boxes and cocks. The expense of heating a house thirty feet long will amount to:—

	£.	s.	d.
For Boilers 5 cwt. at 20*s.* per cwt.	5	0	0
Piping and Elbows.	11	4	0
Nuts and Bolts 30 *lb.* at 5*d.*	0	12	6
Canvass, Red and White lead, &c.,	0	12	6
	£17	9	0
If more houses than one to be heated, the additional expenses of the boxes	3	0	0
Stopcock for each	0	7	6
	£20	16	6

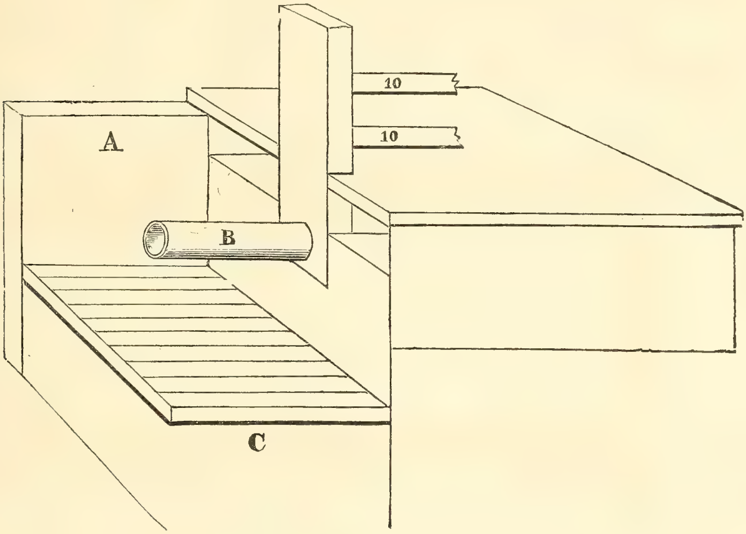


The pipes may be had of Messrs. John Davis, & Sons, or at the Birmingham coal company's foundries, Tipton, Staffordshire. All the difficulty lies in sending a correct statement of the length of the elbows, and the proper quantity of six feet and nine feet pipe wanted. You may then put them together yourselves, allowing a fall of half an inch in every nine feet of pipe, each pipe to be four inches in diameter inside, and to be fastened at each joint by four nuts and bolts. A nine feet pipe of four inches bore, thickness of metal three-eighths, weight 1 cwt. 1 qr. 10 lb., at 10*s.* per cwt., Elbows 12*s.* per cwt. Boiler as stated before; nuts and bolts, 4 to the pound, at 5*d.* Red and white lead, canvas, labour, &c., to each joint 7*d.* The plan of the boiler will answer for any number of houses, if it and the fire place be made wider and longer, according to the power required.

Since we wrote last on this subject Mr. Saul of Lancaster has made another experiment by removing the two pipes 8,8, vol i. p. 136, and fixed one pipe eighteen inches long, and four and a half inches diameter, inside measure (fig. B.) He enlarged the fireplace A, and made the grate flat, as C; but to his great astonishment he was never able to obtain one half the heat, although the size of the fireplace was increased so much.

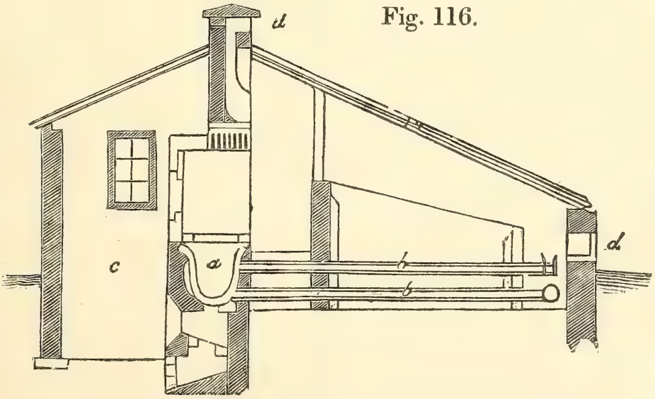
It is therefore quite clear, that small tubes, or pipes, placed in the same way as in vol. i. p. 136, are preferable to one large pipe, as shown in the present figure, B. Also it is a great advantage for the grate to be on an inclined plane, and not level as, C.

Mr. Saul was so convinced of this, that he removed the pipe B, and replaced the two pipes, also the inclined plane, and by these means, he was able to obtain the heat mentioned vol. i. p. 146. It is by small tubes that the engines on the railways obtain their great heat, and Mr. Saul believes that small pipes will answer better than large boilers for heating hothouses, because of the little time required to procure the heat.

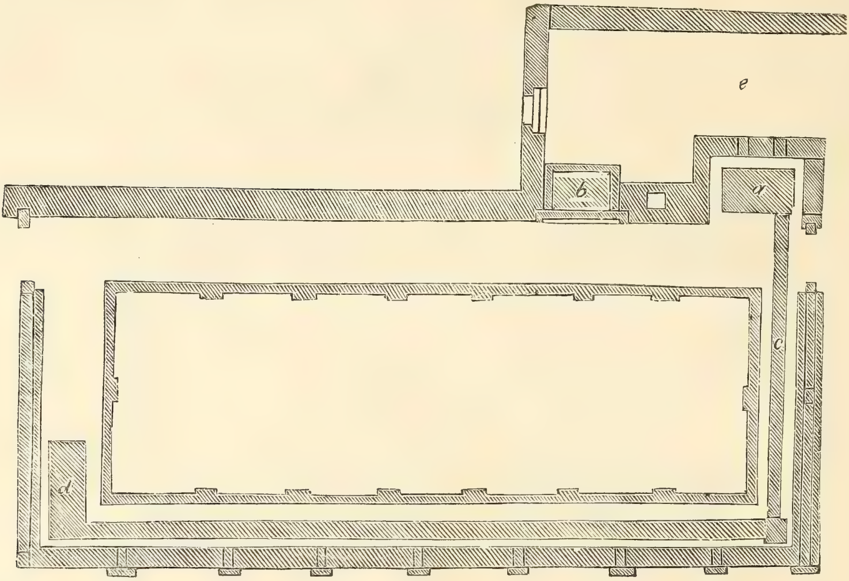


The system of heating by hot water at Woburn Abbey answers exceedingly well, and may be a great help as a guide to those who wish to heat their houses in this manner. There are separate boilers and pipes to each division, or house, of the pinery (fig. 116). The boilers are placed in recesses in the back walls of the houses, the dimensions of which are two feet six inches long, one foot six inches wide, and one foot eight inches deep, of an oblong square. There are two pipes (*b*,*b*, see section) attached to each boiler, one near the top, and the other at the bottom; the upper pipe is round, until it reaches the front of the house, where it forms a square of twelve inches broad by four inches diameter.

Fig. 116.



These pipes convey the water from the boilers across the ends, and along the front of the house to the reservoir belonging each division at *d*, (see ground plan,)



which is of the same dimensions as the boiler; as the pipes, reservoir and boiler, are placed all on the same level, and filled about equally, within half an inch of the top, so as to allow room for circulating the heat regularly from end to the other.

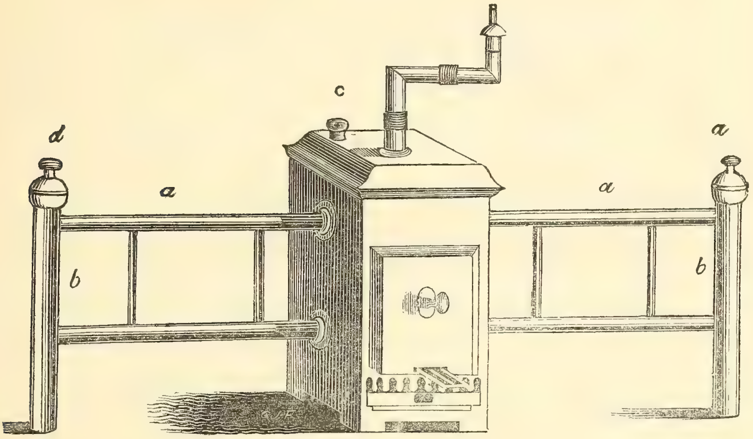
When the fire is lighted under the boiler, the water, as soon as it begins to get hot, immediately ascends to the top of the boiler, and flows along the upper pipe to the reservoir, when it forces the cold before it in the under pipe, back into the bottom of the boiler. The circulation of water is continued from one extremity of the house to the other: the hottest passing rapidly along the upper pipe, and the coldest returning through the lower one, back into the boiler, which will soon heat the pipes so as to raise the atmosphere of the house, in the severest weather, from seventy-five to eighty degrees, and that when there are twenty-eight degrees of frost. The pipes, boiler, and reservoir contain about 140 gallons of water; when the fires are first lighted, every thing being cold and damp, it takes about an hour to heat the water to 130 degrees; but when it is once heated, after the first night, it may be raised to the same temperature in twenty minutes. The furnace is attended from the shed behind (*e*).

A very simple portable hot-water apparatus for heating conservatories, or other rooms, invented by Mr. Joshua Major, was exhibited near us some time ago, and shortly afterwards was figured in the Gardener's Magazine, from whence we extracted it and inserted it, vol. iii. page 181. The apparatus may be either made of tin or copper: the latter, though of course it would cost more at first, would, owing to its durability, no doubt be the cheapest.

Charcoal is employed for heating: oil lamps have been tried instead of it, but with not near so good an effect. As it is necessary to employ pipes to conduct the effluvium, arising from the charcoal, out of the places required to be warmed, it will, in order to secure all the heat possible, be of importance to introduce a sufficient length to allow the whole heat to pass off, before the ends of the pipes are turned to the outside.

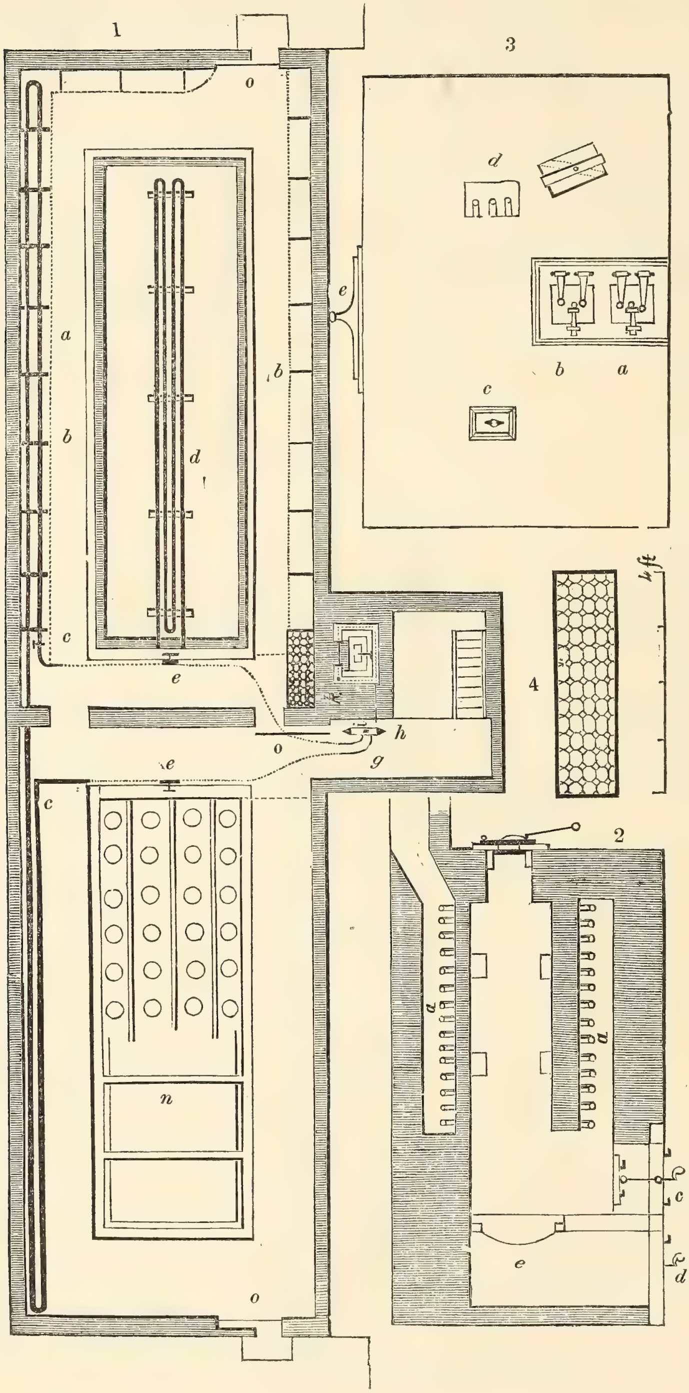
In order to make the smoke conductors suitable for any situation, it is only necessary, in addition to the elbow pipes, to be provided with several lengths of straight pipes; placing one elbow upon the permanent smoke conductor, connected with the fire, and the other at the extremity, or midway of the piping, as it may be required.

The larger sized apparatus could not well be more than eight feet long; for if arger, it would be inconvenient to move about. The size of the one which appears most useful is as follows:—The whole height of the centre portion of the apparatus, comprising the boiler, &c., is fifteen inches, and width five inches and a quarter, by seven and a half inches; the fire-pan is five inches and three-quarters, by four and a half inches, and three inches and a half deep; surrounded on three sides by a boiler half an inch in diameter, which becomes more spacious upwards, as the fire-place diminishes.



The opening necessary for the reception of the fire-pan, and for supplying it with fuel, is six inches wide, by five and a half deep; at the top of the opening the fire-place commences tapering; consequently the water in the boiler expands more immediately over the fire; the smoke pipe takes its regular width, one and a half inch in the boiler, about an inch below where the lid unites; the horizontal water pipes (*a*) are each twenty-eight inches long, by two inches diameter; the end pipes (*b*) are fourteen inches and a quarter by three inches diameter; a feeder (*c*) is added, in case it should be thought better to have the lid fixed tight on the boiler.

In order to promote the circulation of the water, small holes are to be perforated in the tops of the lids (*d, d,*) which are also intended to be fixed tight. The apparatus may either be placed on the floor of the place to be warmed, or raised by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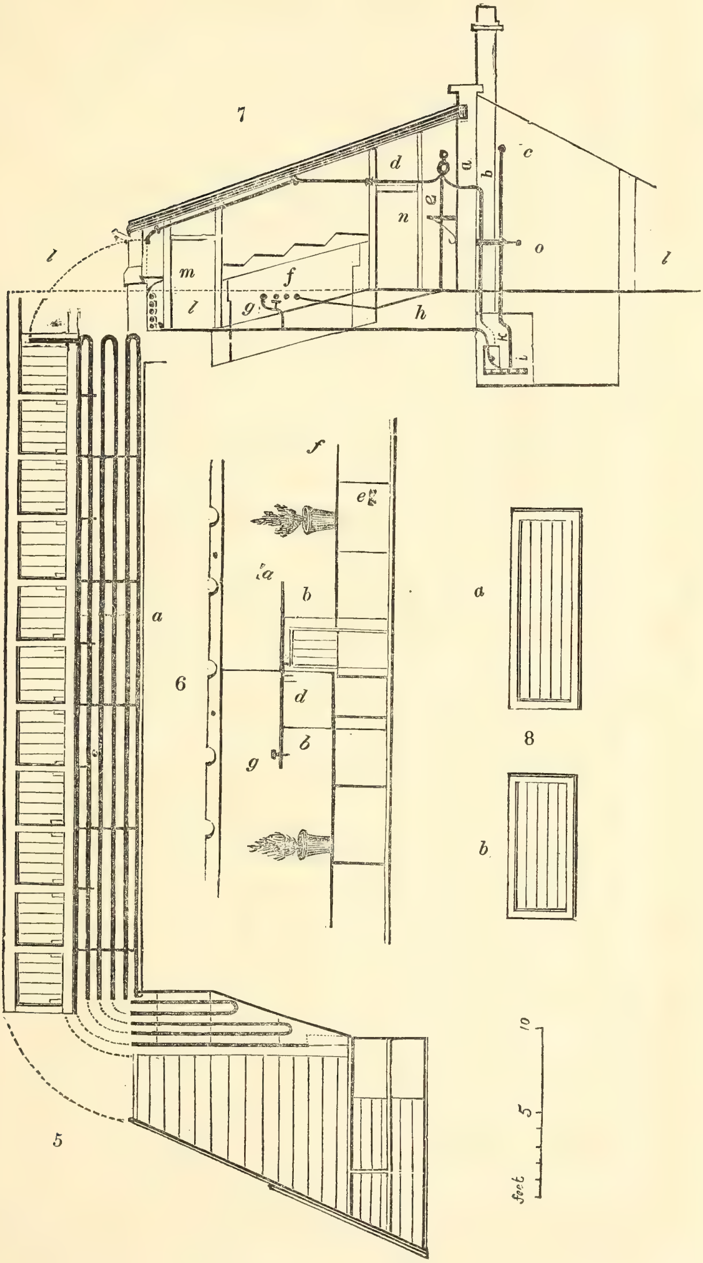
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bearers, or suspended by wire or cord; the two latter methods assist the fire to burn more freely.

But when a very powerful heat is required, the system adopted at the seat of J. T. Crosley, Esq., Wavertree, near Liverpool, will answer. The required degree of heat is easily obtained by regulating the damper, and by means of cocks. In consequence of the grate becoming choked with scoriæ, it sometimes happens that open dampers and full circulation will not effect the desired heat; in that case tilt the door on the top of the furnace with an iron wedge, about two inches high, this will soon raise the heat to the degree required; in fact, if coals are used, this door should always be left a little open, or the hydrogen collecting at the top of the furnace may explode, and rift the brickwork. Where coke is used this can never happen, that principle being in a great measure extracted.

In the ground plan 1, *a,* is intended to show two pipes upon the front walk: *b,* brackets supporting the front pipes, and iron trellising, round the house; *c,* cocks to turn the front pipes off; *d,* pipes for heating the pits; *e,* cocks to turn the pit pipes off; *f,* iron trellising for flower-pots; *g,* return pipes for each house, coned into the connecting pipe; *h,* connecting pipe; *i,* return pipe to the coil; *k,* flow pipe from the coil; *l,* a portion of the pit covered in with boards; *m,* holes cut in the boards, for the pots of plants requiring bottom heat to rest on their rims; *n,* bearers to support the boardings and pots; *o,* sliding doors.

No. 2 is a section across the furnace: *a,* is a coil or boiler consisting of fifteen rounds of inch piping set in a descending furnace; *b,* iron-door and casing upon the top of the furnace, for putting down the fuel; *c,* double door for lighting the fire, and drawing out the scoriæ; *d,* ashpit door; *e,* grate bars; *f,* iron bridge supporting the wall which separates the fire from the coil.

No. 3 is a representation of the front of the furnace: *a,* is the ashpit door; *b,* the fire door; *c,* dust door, for cleansing the coil; *d,* the same open; *c,* the furnace top door.

No. 4 is a representation of trellis, supported by brackets, *b,* in the ground plan, No.1.

No. 5 is the elevation of the front inside: *a,* is intended to represent six pipes against the front wall; *c,* short brackets for trellising.

No. 6 is the elevation of the back wall: *a,* is the expansion pipe; *b,* flow pipes to the pits; *c,* flow pipes to houses on each side of glass partition, going over the doors to the front wall; *d,* flow pipe from the coil to the expansion pipe; *e,* brackets for supporting the trellising; *f,* back trellising; *g,* air-screw.

No. 7 is a section of the house and shed: *a,* is the expansion pipe (see *a,* No. 6) *b,* flow pipe; *c,* filling pipe; *d,* flow pipes for each house; *e,* flow pipes for each pit; *f,* pit pipes; *g,* cocks for pits; *h,* return pipes for pits and houses; *i,* connecting pipe; *k,* dust door for cleansing the back of the coil; *l,* six front pipes; *m,* brackets supporting front pipes and trellising; *n,* brackets supporting the back trellising; *o,* damper.

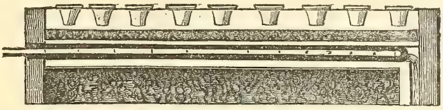
No. 8, are figures of roof lights: *a* is the bottom light, and *b* the top one.

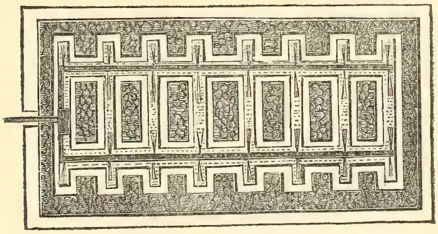
The small scale is for Nos. 1, 5, 6, 7, 8, and the large one for Nos. 2, 3, and 4.

Mr. Stothert, civil engineer, Bath, has described in the transactions of the

Horticultural Society of London several modes of heating by steam, which no doubt would be found to answer

For Bulbs, Cacti, &c. These two figures represent an elevation and plan, exhibiting the mode in which bottom heat is supplied to stoves for bulbs, cacti, &c., by the agency of steam. A paved water-tight bottom being built on stones, earth, or any suitable support, with a declivity towards any convenient part, of about one inch in ten feet to allow of drainage; channels are formed about three inches deep, and of the same width, crossing each other, shown in the lower figure, which also represents two small steam-pipes, each three-quarters of an inch diameter, closed at the further end, and having perforations about one tenth of an inch diameter opposite each other, and in the middle of the channels.

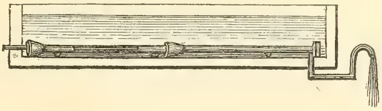




The result is, that when steam is admitted into the pipes, it is discharged in opposite directions, through the orifices, filling the whole space of the channels with hot vapour; the channels being covered with brick or stone, jointed without mortar, the vapour which percolates between the joints is arrested by a bed of stones or broken bricks, about fourteen inches deep above the paved bottom; on this again is placed a bed of sand about one foot deep, in which the pots are plunged to any suitable depth.

The vapour is so completely arrested by the strata of stones, &c., and sand, beneath the pots, as to communicate a heat congenial with the health of the plants, without the least excess of moisture.

For Aquatic Plants. This figure represents a mode of warming a cistern or reservoir of water for the preservation of Aquatic Plants, as erected at Mr. Miller's Nursery, at Clifton, in front of one of the greenhouses, and having a glass roof. Steam is admitted by a pipe three quarters of an inch diameter, having perforations



of about one tenth of an inch at each foot in length, the extremity of the pipe being closed: and it issues through small apertures, filling the whole internal area of the large pipe in which it is inclosed, imparting an equable temperature to the whole extent of surface; an effect which cannot be obtained by applying steam in the common way, when but a small increase of temperature is required; as the water immediately in contact with the pipe where the steam is admitted would absorb nearly the whole of its heat, till it arrived at a temperature far beyond what could be allowed in a case of this kind.

The dimensions of the reservoir alluded to, are about three feet by three feet six inches, and twenty feet long. The external pipe four inches inside diameter, the condensed water from which is taken away by a small syphon at the further end.

ON SOWING THE SEEDS OF GRASSES TO FORM A GRASS PLOT, WHEN IT IS NOT CONVENIENT TO GET GOOD TURF.

As, in many parts of the country, it is very inconvenient to obtain turf for forming lawns, and in other places, where it can be obtained, the expense is great, and the grasses of which such turfs are composed are not the kinds at all calculated to make, when completed, a good smooth grass-plot, the few following hints on sowing the seeds for one, may not be without its use.

The system of sowing is not often practised; this may be accounted for, first, because the ground so sown remains unsightly for a length of time, before the young grass has sufficiently grown to cover it, whereas, turfing at once covers the ground, and renders the appearance complete. Secondly, because persons willing to sow are not acquainted with the kinds of grass best suited for the purpose, or the proportions wanted; and, to purchase at a seed shop at hazard, might render the plan more expensive than turfing, and, after waiting for a considerable time, the surface, from the kind of grass sown, might appear nearly as coarse as a pasture field.

With regard to the first objection, it must be admitted that the ground appears very unsightly for a long time, whilst the grass is growing, and where it is particularly necessary to have the ground covered at once, and where good turf, of suitable grasses, can be got, sowing should never be resorted to. But, if the turf cannot be gotten good, and the unsightliness can be borne with for awhile, the subsequent beauty and durability of the lawn, so made, will fully recompense for the trouble and patience exercised, and will be less expensive than turfing would be.

The second objection may be speedily removed by the few following remarks:—

The kinds of grass most suited for forming a smooth and handsome lawn, are such as possess a beautiful green verdure throughout the year, and the foliage of which never becomes rank and coarse.

The situation, and kind of soil, will be necessary matters of consideration to the person intending to sow, as the kinds that will form a good surface on one soil and situation will not in another, and so the person recommending the kind of grass might be blamed without a just cause.

If the situation is *hilly* and *dry*, with a *light sandy soil*, the following sorts will be best to sow:—*Poa pratensis*, *Cynosurus cristatus*, *Festuca ovina*, *Festuca tenuifolia*, and *Trifolium minus*.

For a hundred square yards of land, the following proportions may be used: *Festuca ovina*, one quart, *Festuca tenuifolia*, about a pint and a quarter, three quarters of a pint of *Poa pratensis*, and the same quantity of *Cynosurus cristatus*, and one quart of *Trifolium minus;* mix these well together, and, after the ground is prepared, sow them evenly all over the surface.

The proportions for an acre would be—one bushel and a half of *Festuca ovina*, one bushel of *Festuca tenuifolia*, one bushel and a half of *Trifolium minus*, two pecks of *Poa pratensis*, and two pecks of *Cynosurus cristatus*.

If the situation be hilly, and the soil dry, but not sandy, use, for one hundred square yards, the following proportions: one quart of *Poa pratensis*, one quart of *Trifolium minus*, one pint and a quarter of *Festuca tenuifolia*, and one pint and a quarter of *Cynosurus cristatus*. Use for an acre a bushel and a half of *Poa pratensis*, a bushel and a half of *Trifolia tenuifolia*, one bushel of *Festuca tenuifolia*, and one bushel of *Cynosurus cristatus*. Mix them well together before sowing.

If the situation be not over-dry, or over-wet, with a good loamy soil, then the following sorts will answer the best: *Anthoxanthum odoratum*, *Agrostis vulgaris*, *Festuca duriuscula*, *Festuca rubra*, *Lolium perenne Whitworthensis*, *Poa pratensis*, *Poa trivialis*, and *Trifolium minus*. These may be sown on an acre, in the proportions of six pecks of *Trifolium minus* to two pecks of each of the other seven grasses. Or, for one hundred square yards of ground, one quart of *Trifolium minus* to three quarters of a pint of each of the others. To be all well mixed before sowing.

But, if the situation be low and damp, use of *Poa trivialis* a bushel and a half, *Trifolium minus*, a bushel and a half, *Anthoxanthum odoratum*, *Agrostis vulgaris*, *Festuca duriuscula*, *Festuca rubra*, and *Lolium pratense Whitworthensis*, each a peck and a half to the acre. Let all these be well-mixed together. Or, for one hundred square yards of ground, use one quart of *Poa trivialis*, one quart of *Trifolium minus*, and half a pint of each of the other five grasses.

The sorts recommended for lawns are the following:—

Anthoxanthum odoratum.—A good grass for loamy land, is the kind that generally smells so delightfully in a new mown hay field.

Agrostis vulgaris.—The Common Bent Grass, very good for loamy soil.

Cynosurus cristatus.—Crested Dog's Tail Grass, grows well on dry sandy land.

Festuca duriuscula.—A kind of Fescue Grass, which forms a good bottom on loamy soil, but does not thrive so well in dry situations.

Festuca rubra.—Creeping Fescue Grass; this also does the best on loamy soil.

Festuca ovina.—Sheep's Fescue; this will not make a good bottom any where, except on hill-sides or dry sandy soils. It is a good grass for dry situations.

Festuca tenuifolia.—Slender-leaved Fescue; this is good for growing in dry situations, but not so valuable as the last. It seldom makes so good a bottom as the foregoing.

Lolium perenne Whitworthensis.—A variety of the five-leaved rye grass. It grows best on a loamy soil.

Poa trivialis, or Common Meadow Grass, makes a good surface on a moist surface, but is apt to parch up in dry situations.

Poa pratensis.—Smooth-stalked Meadow Grass, grows fine on loamy soil, and forms a good surface.

Let the land be well cleansed previous to sowing, or the grass-plot will soon become unsightly with weeds after being sown.

A FEW REMARKS ON SOME OF THE PLANTS BELONGING TO AMARYLLIDEÆ.

Perhaps no family of plants exhibit more brilliancy of colours, combined with delightful fragrance, than do the flowers of those belonging to this order.

The *"lilies of the field"* have excited admiration from the earliest ages of the botanical study, and the accounts which have been transmitted to this country by botanists and other travellers, leave no doubts as to these being the flowers intended.

They are all bulbous-rooted, and differ but little in the figure and general appearance of the leaves. The order contains thirty genera, many of which are found deeply rooted in the burning shores of islands in the torrid zone, where scarcely a blade of grass will grow. These will only thrive in the stove under peculiar treatment.

Many are found in the damp and sultry woods of South America, where they are completely overshadowed by trees, and never see the light of the sun; these also require shade, and a place in the stove.

Some grow intermingled with *ixias* and *gladioluses* in Southern Africa; these for the most part require no greater heat than the greenhouse or vinery. Others again are to be met with in the cooler provinces of Europe and Asia, many of which are perfectly hardy, and the others require only the shelter of a frame through the winter.

Hæmanthus. (Blood-flower.) These all require the temperature of the greenhouse, and the most part will thrive in any rich mould. There are a few, however, which seem to prefer a considerable portion of peat and sand, mixing with the mould, as *maculatus, hyalocarpus, rotundifolius, pumilio,* and *carneus. H. crassipes* and *orbicularis* will flower better if potted in quite strong loam; let them stand on the front curb, or any situation near the glass, and be cautious not to give them water when in a torpid state. They are very easy of culture, and may be propagated by offsets.

GALANTHUS. (Snow-drop.) The treatment of this genus is too well known to require any explanation; it will grow in shady situations where scarcely anything else will, and any light soil will suit it.

LEUCOJUM. (Snow-flake.) These much resemble the last in habit; the *L. autumnale*, the handsomest species, increases rather slowly, and is apt to perish, particularly if the land be heavy. They all do best in sandy loam, on the open borders.

STRUMARIA. These are all natives of the Cape of Good Hope, and consequently greenhouse plants; they grow freely in sandy loam, mixed with about equal parts of leaf mould, or peat, and require the same treatment as Hæmanthus.

CYRTANTHUS. The different species of this genus require only the heat of the greenhouse, and only that during the colder months of the year; those who have no other conveniency may grow them to perfection in a frame, by potting the bulbs very shallow in light sandy loam, mixed with equal parts of peat earth, or leaf mould, and watered very sparingly when not in a growing state; they, however, must be allowed plenty during their time of flowering, and if fresh potted just before they begin to grow, they will, in general, flower very freely, and occasionally ripen seeds, by which, and offsets, they are readily propagated.

GASTRONEMA requires precisely the same treatment and soil as the *Cyrtanthus*.

PHYCELLA.—The *ignea* and *cyrtanthoides* will thrive in any light rich mould, and should be treated like other half-hardy bulbs: the *corusca* and *Herbertiana* require the heat of the green-house, and grow best if potted in a considerable portion of sandy peat, and the bulb of the latter should be planted pretty deep in the soil. In respect to watering, &c., they must be treated like the *Amaryllis*.

VALOTTA.—This genus contains but one species, of which there are two varieties cultivated in our gardens. Although introduced from the Cape of Good Hope, they both require the heat of the stove, and should be potted in sandy peat, mixed with equal parts of turfy loam; their general treatment is like the *Amaryllis*.

STEENBERGIA.—All the species of this genus are perfectly hardy, and will do well in any light rich mould; care, however, must be taken not to plant the bulbs too deep, or they are liable to perish in wet seasons. They are readily increased by offsets and seeds, which they produce pretty freely in fine seasons.

ZEPHYRANTHES.—The *candida*, *Atamasco*, and *chloroleuca*, thrive well in common rich mould, and may be treated as other half-hardy bulbs; the *tubispatha* and *rosea* will grow in the same soil, but require the heat of the green-house; all the other species must be potted in very sandy loam, with a small portion of peat and leaf-mould, and placed like the two last in the green-house. The *candida* closes its flowers in the evening, or when placed in the shade, after the manner of the Crocus.

HABRANTHUS.—All the flowers of this genus are very delicate, the *versicolor* and *graciliformis* are very fragrant; they may be planted out in light rich mould, or any warm border, and, if covered in severe or very wet weather in winter, with an inverted flower-pot, the bulbs will be preserved from perishing, and will flower very freely; the *bifidus, rosea, Bagnoldi,* and *phycelloides,* will all thrive well if planted in a border, in the front of a stove or green-house; let the bulbs be well covered in winter, to keep them from being injured by frost or wet; the *Andersoni, lorifolius, angustus,* and *spathaceus,* all require the green-house, and should be treated exactly like the *Amaryllis,* and other green-house bulbs in this order. They are all increased by offsets, and occasionally by seeds, which, however, they very seldom ripen.

DORYANTHES. This genus contains but one species, the *excelsa,* it differs materially from all the preceding genera, the flower stem growing to upwards of twenty feet high. It grows freely in a mixture of sandy loam, peat, and well-rotted leaf mould, and should be placed in the conservatory. It may be increased by suckers from the roots, which are sparingly produced.

GETHELLIS. All the species are green-house plants, natives of the Cape of Good Hope, and should be potted in sandy loam and peat, "the berries of the *Afra* are said to be eatable, having an agreeable odour." They require the usual treatment with regard to watering, &c., as the other *Cape Amaryllideæ.* They are increased by offsets and seeds.

EUCROSIA. This genus contains but one species, the bulbs of which grow best in a light turfy soil, mixed with a little peat, and a considerable portion of sand. As they are very impatient of wet, the pots should be well drained with potsherds, and the bulbs planted shallow. They only require the temperature of the green-house, and the general treatment of Cape bulbs.

EURICLES. A genus formerly included in *Pancratium,* the leaves are broad, not unlike those of the *Hemerocallis.* They are all stove-plants, and require the same treatment as *Pancratium.* They are propagated by offsets.

CALOSTEMMA. The species of this genus should be potted in sandy loam and peat, and be kept in the green-house. They must have little or no water when in a torpid state: and, if replanted previous to their beginning to grow again, they will flower very freely, and ripen plenty of seeds, by which, and offsets, they are readily increased. Their general treatment is the same as other green-house bulbs in this order.

CHLIDANTHUS. This genus has but one species, a very fragrant and beautiful plant, with bright yellow flowers. It should be potted in similar soil to that recommended for *Calostemma,* and kept in the green-house. It produces its flowers before the leaves appear, similar to the Guernsey lily; every means should therefore be used to facilitate the growth of the leaves, as the flowering of the ensuing spring depends, in a great measure, on the maturity they attain. When the leaves have died down, the bulbs should have no water given them, but be kept in a torpid state until towards the usual time of growth, when they should be repotted, taking off all the old soil, and separating the offsets for propagation.

CHRYSIPHIALA.—Green-house plants, with similar habits to the last, requiring the same general treatment.

ACIS. All the three species are hardy, and should be planted in the open border, in light sandy soil, where they grow and flower freely. They are increased by offsets, which are plentifully produced, and may be treated generally in the same manner as the snow-drop, or snow-flake.

Coburghia. The species of this genus are rather shy at flowering; they may be said to be half-hardy bulbs. They require to be planted out in a warm border under the wall of a stove or green-house, where, if the weather is not very severe, they will endure the winter; the safest plan, however, is to always take them up when the bulbs are ripe, and preserve them in bags through the winter. In April, plant them out in some good strong rich loam, when they will probably flower, and produce plenty of offsets, by which they are propagated.

Olivea. This splendid genus requires only the heat of the green-house, and that only during the cold months, they may be grown to perfection in a frame, by planting the bulbs in a good rich turfy loam, mixed with a small portion of leaf mould, the bulbs should be potted very shallow, and watered with care. When in a dormant state they should be kept quite dry; and, if fresh potted just before they begin to grow, they will flower pretty freely. They are propagated by offsets.

GARDEN SEATS.

The annexed garden-seat was exhibited some time since at the Horticultural Society's rooms. There does not appear to be any thing new in it; but it forms a very comfortable seat, is very portable, and is capable of being packed in a very small compass, when not in use, or in bad weather. Fig. (*a*) is as it is used; (*b*) in its compressed form.

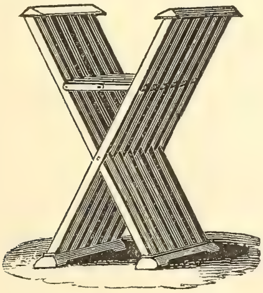


Fig. (*a*).

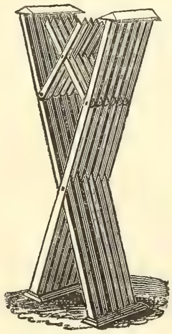


Fig. (*b*).

OPERATIONS FOR APRIL.

Anemones. Those roots planted in September and October will come into flower this month. See page 17.

Anomatheca Cruenta may now be planted on a warm border in the open air. Vol. 1, page 103.

Banksias may now be potted in a mixture of peat, light loam, and a small portion of sand. Be particularly cautious to give a good drainage, Vol. 1. page 120. Another circumstance may be taken notice of here, which was omitted when treating on the culture of these plants; that is, as they are so liable to be injured both by drought and over-watering, some pieces of freestone, about an inch or less square, may be placed amongst the soil, which by absorbing the moisture will prevent the roots from perishing so easily with drought, and at the same time also, by keeping a free circulation of water through the soil, they are not so liable to be injured by over-watering.

Brachysema latifolia may still be propagated by layers, or inarched on the stocks of *B. undulata;* or cuttings will strike pretty readily if planted in sand under a glass.

Bouvardia triphylla. About the middle of the month collect all the plants of this species together, and repot them; for particulars, see Vol. 1. page 225.

Calandrinia speciosa, &c., may be propagated by seeds and cuttings early in the month. Vol. 1. page 222.

Calceolarias. All the annual species and varieties should now be sown on a hot-bed, if not done before. About the end, begin to expose the plants of shrubby and herbaceous kinds to a deal of air, and afterwards remove them from the green-house to a cold frame. Vol. 1. page 247.

Calochortus venustus and the other species will now be growing fast; place the pots in which they are growing, in a very airy part of the green-house, until the beginning or middle of May, when they may be turned out into the open borders in a warm situation. Vol. 1. p. 75.

Cyclamen persicum. At the end of the month take up the roots of the seedlings raised from seeds gathered last year, and plant them in a bed of light soil, composed of loam, leaf-mould, and rotten dung, with a small portion of sandy peat. See Vol. 1. page 180.

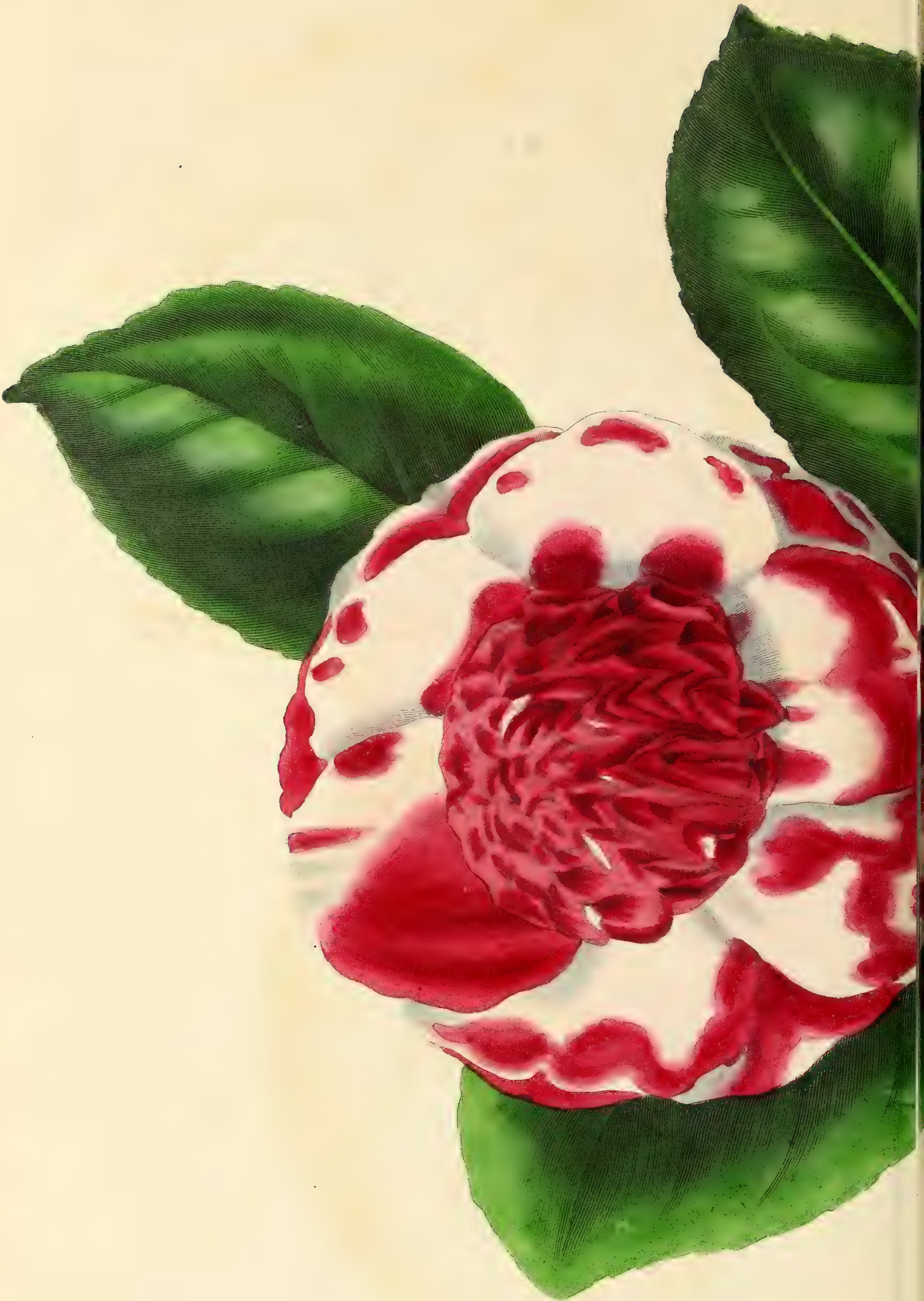
Francoa. The roots may be still divided, and seeds sown, if not done before. Vol. 1. p. 235.

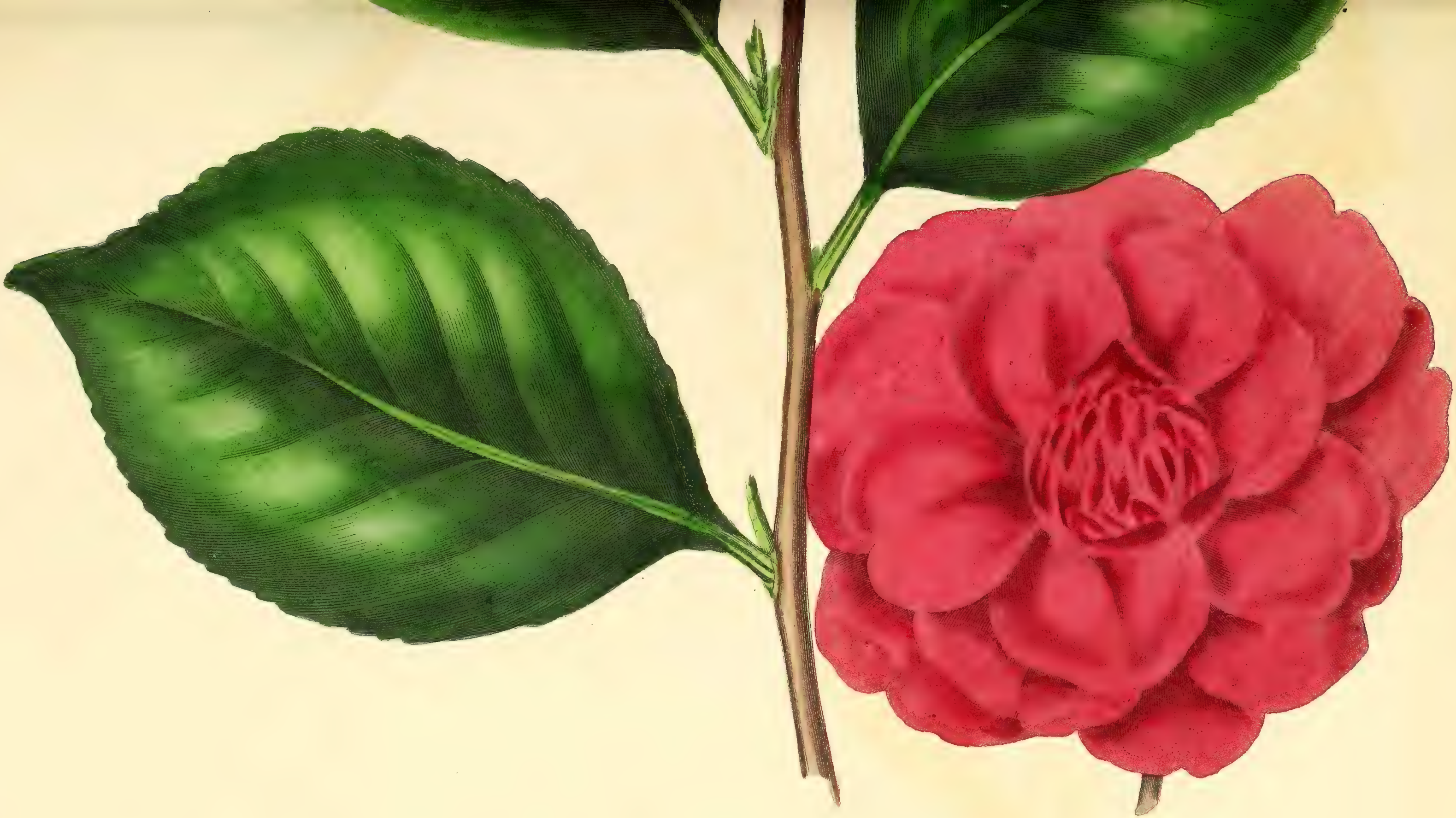
Gardenia radicans and Florida should be potted and placed in heat, if not done before. The *Florida* should now be propagated by cuttings. Vol. 1. p. 226.

Gesnerias. These plants may now be propagated by their leaves. Vol. 1. p. 13.

Tacsonia pinnatistipula may now be propagated by cuttings of the previous year's shoots, planted in sandy soil, and plunged in a hot-bed.

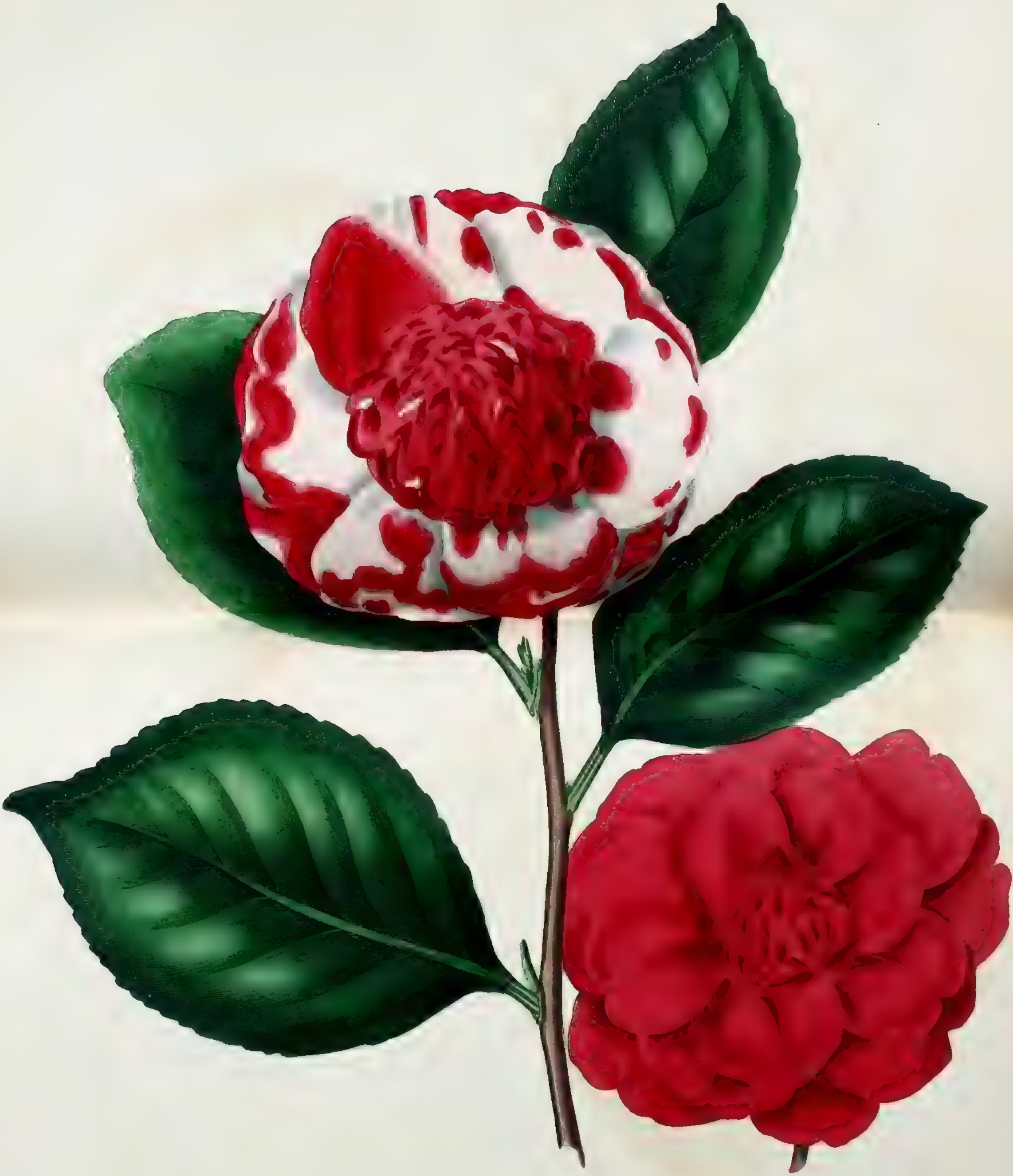
Oxalis crenata. Plant the tubers of this species in pots, and place them in a gentle heat to forward them, previous to turning out into the open ground.





Camellia Japonica Chandlerii

E.W Smith del et sc



Camellia Japonica Chandlerii

CAMELLIA JAPONICA CHANDLERII.

(CHANDLER'S JAPAN CAMELLIA.)

CLASS.
MONADELPHIA.

ORDER.
POLYANDRIA.

NATURAL ORDER.
CAMELLIACEÆ.

GENERIC CHARACTER.—See page 25 of the present volume.

SPECIFIC CHARACTER.—See page 25.

CHANDLERII.—*Flowers* large, anemone-like, sometimes variegated, at other times plain red, free flowering.

THIS elegant variety was, we understand, raised from seeds by Mr. Chandler, in 1819. The flowers, as will be seen by our figure, are subject to sport a deal, sometimes producing flowers variegated, and very beautiful, at other times of a plain rich red, without any mark of white to be seen. The plant from which our drawing was taken produced only one variegated flower, which happening to be the first, we sent it to the engraver's, but the remaining flowers opening all plain red, we were induced to add one of the red flowers.

It requires the same kind of treatment as the other species and varieties of *Camellia,* for which see vol. 1. page 33.

CEANOTHUS AZUREUS.

(AZURE-FLOWERED CEANOTHUS.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
RHAMNEÆ.

GENERIC CHARACTER.—*Calyx* quinquefid, or in five parts. *Petals* five, bagged. *Berry* dry, three-seeded.

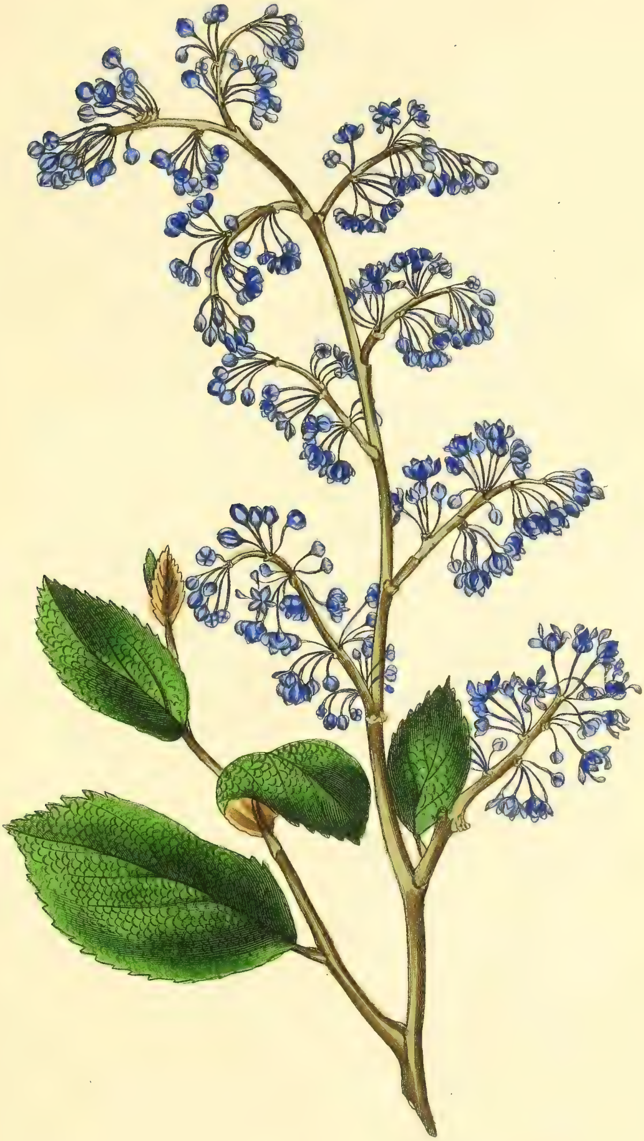
SPECIFIC CHARACTER.—*Plant* shrubby. *Branches* round, tawny brown, covered with a soft downiness. *Leaves* betwixt ovate and oblong, serrated, upper surface green, and underneath tawny, downy, like the stem; veins somewhat netted, particularly visible on the upper surface. *Panicles* produced on the side shoots or branchlets. *Flowers* blue, and rather small. *Calyx* somewhat darker in colour than the corolla. *Corolla* of five petals, somewhat spatulate.

SYNONYM.—Ceanothus cæruleus.—*Loddiges*' *Bot. Cab.* 110.

SCARCELY any of the species of this genus are worth cultivation, where a selection for beauty are wanted. The present subject, however, is an exception; though the flowers are small, the figure of the plant, when well grown, is graceful, and the panicles of flowers are beautiful.

Its native country is scarcely known. Messrs. Loddiges believe it to be a native of New Holland, but this is thought improbable by Dr. Lindley. It was introduced by Messrs. Loddiges, in 1818, who received it from M. Parmentier's collection at Enghien.

It is a green-house plant, growing from six to ten feet high. The best kind of soil for it is equal parts of peat and loam; and it is propagated without much difficulty by cuttings of the young wood, planted in sand, covered with a bell glass, and placed in a little heat.



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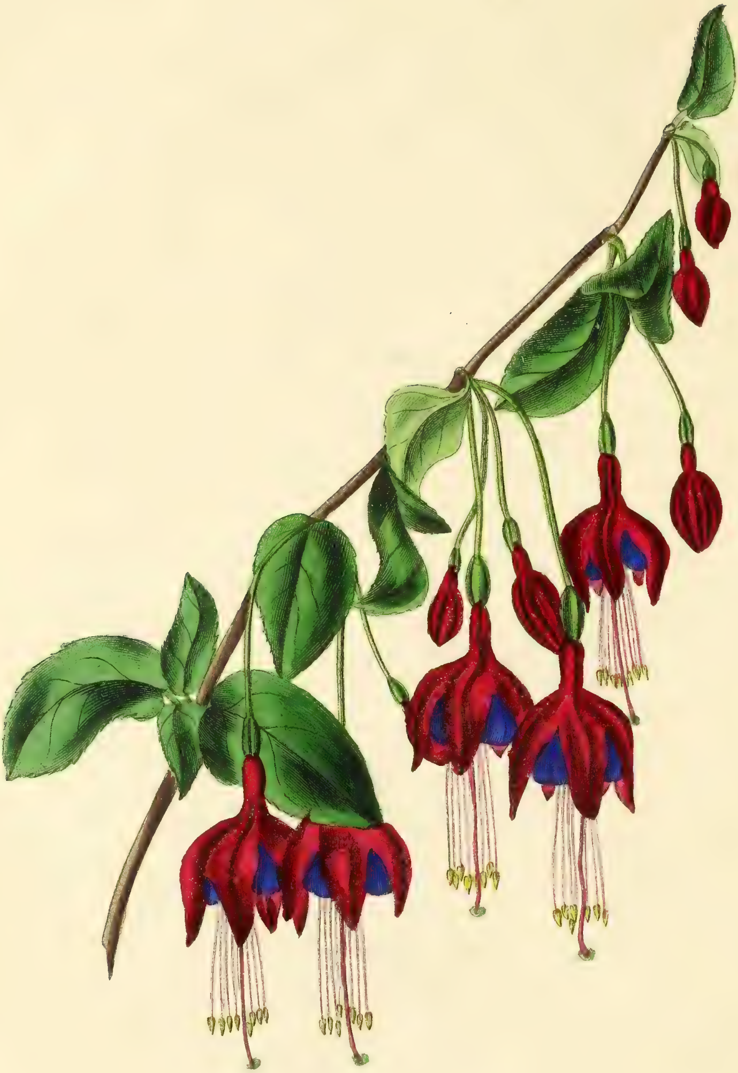
Ceanothus azureus



F. W. Smith del.

Fuchsia globosa.

FUCHSIA GLOBOSA.

(GLOBE-FLOWERED FUCHSIA.)

CLASS.
OCTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
ONAGRAREÆ.

Generic Character.—*Calyx* four-parted, coloured, funnel-shaped, deciduous. *Petals* four. *Berry* four-celled. *Seeds* many.

Specific Character.—A dwarf shrub, from a foot to eighteen inches high. *Leaves* usually opposite, sometimes in threes, bright green, toothed, ovate, and pointed. *Flowers* axillary, pendulous. *Calyx* rich crimson. *Petals* purple lilac, about half the length of the calyx.

This beautiful kind is stated by Mr. D. Don to have been raised from seeds of the *F. conica* by Mr. Bunny. It is certainly a plant of very great beauty, perhaps exceeding any other species or variety known.

It is dwarf and somewhat spreading, and the slender branches are sparingly covered with leaves, which are not of a large size. The blossoms are of a brilliant scarlet, and are shown to great advantage in consequence of the smallness of the leaves. Before expansion they are remarkable for their globular form, and also when fully expanded they continue to present a similar appearance, as the points of the calyx still continue to curve outwards.

The plant from which our drawing was taken flowered in the open border at Chatsworth, planted in light rich loamy soil, where it appeared to flourish very well, and continued flowering until cut down by the frost. It is necessary, however, to shelter it in the greenhouse in winter.

The best mode of propagation is by cuttings of the young wood, put in whilst quite tender in spring, and placed in a little bottom heat.

OF THE GENUS GLOXINIA.

THIS most elegant family stands pre-eminent in the natural order *Gesneriæ.* A few years only have passed by, since this order comprised two genera only, namely, *Gesnera* and *Gloxinia.* Now, subsequently to 1820, it has received four additional families, some of which have been separated from *Gesnera* or *Gesneria.*

The six genera now ranking in order are—

1. GESNERA—the type; named after the Swiss botanist, Gesner. Almost the whole of the numerous species have been introduced since the year 1815.

2. GLOXINIA.—Of this fine genus, one only, *maculata,* or the spotted-stalked, was known in the eighteenth century; all the others are new. The name is derived from the French botanist, Gloxin.

3. SINNINGIA.—So called from a gardener of the name of Sinning: it is a new genus, the first species of which was introduced in 1820.

4. CODONOPHERA.—From Κωδων, a bell, or trumpet-mouth. Removed by Dr. Lindley from *Gesnera.*

5. PENTARAPHIA.—Literally means five needles, one species; formerly *Gesneria ventricosa;* a Jamaica plant, 1823.

6. BESLERIA.—From Besler, a German apothecary. This genus is old; it formerly belonged to *Scrophularinæ.*

These species are almost all natives of hot, tropical climates, and therefore rank as stove plants. They have many characters in common, and may perhaps be all successfully grown in decayed wood, or the vegetable earth of leaves and sticks, blended with a little sharp sand.

GLOXINIA is found in the fourteenth class, second order, of the Linnæan System of Botany—*Didynamia Angiospermia.* The stamens are four, unequal in size, that is, two are shorter than the other. The calyx is five-leaved, fleshy, the terminations pointed. Corolla bell-shaped, or closely resembles that of the foxglove; its limb, or border, unequal, oblique. Filaments of the stamens inserted in the receptacle.

GLOXINIA SPECIOSA (specious or showy *Gloxinia*), has been cultivated since 1815, and is a native of South America. There are two varieties, one with beautifully blue, rather pendulous blossoms, tinged with purple, very glossy, or with the peculiar blush of silk velvet; another with white flowers—the leaves are large, oval, bordered, and notched (*crenate*).

GLOXINIA CAULESCENS.—From Pernambuco, in 1825. This species differs from the last in having a stem, which rarely, however, attains the height of a foot; but the leaves are produced from it, and these are of a darker green, more rigid and firm than those of the *speciosa;* the flowers are larger, of a more intense blue, relieved with purple. They are most elegant.

GLOXINIA HIRSUTA (hairy *Gloxinia*).—A lovely little plant, with downy stalks and leaves, the tint of which is olive-green. The flowers are more numerous, of an extremely pale purplish tint, approaching to white, elegantly striped with red-purple. This species is also a native of South America, introduced in 1824.

The *speciosa* and *caulescens* are readily increased by cuttings of the stems, at any time after they emerge; or by leaves taken off with the little bud attached to the base of the leaf stalk. These may be placed in silver sand, or even heath-mould; and if kept temperately moist, and in a close frame, with a heat of seventy or seventy-five degrees, will produce roots. But the most interesting process is perfected by taking leaves with the bud, placing them singly in a phial of water, on a delf oven or upon a flue, or plunged in a leaf-bed where a gentle heat of seventy-five or eighty degrees may be maintained. After a few days the part that joined the stem becomes convex, enlarges, assumes a rather hemispherical form, and sends forth a few silky fibres; these elongate; more are produced; and in three weeks (more or less, as circumstances occur) the plant may be lifted from the water, and transferred to light peat earth, at first well filled with white sand, in a very small pot. The minute leaves which formed the germ upon the base of the leaf enlarge, others are sent forth, and a complete little plant is developed. Finally a perfect bulb, or more properly a tuberous underground stem, is formed, and this, when the leaves wither, retains the vital principle during the winter.

The few foregoing remarks were penned by the Author of *The Domestic Gardener's Manual,* a contributor to the *Horticultural Register.* We intended to have added some remarks of our own, but must defer them, for want of room, till another opportunity. One observation, however, may be made here, viz., that in propagation, if the leaves be taken off without any bud, or even without the leaf-stalk, and the underside be laid flat on a pot of soil, roots will be formed, and a plant produced; without doubt, with a bud, this process is greatly facilitated, and, in the absence of that, a portion of the leaf-stalk.

NEW AND BEAUTIFUL PLANTS, FIGURED IN THE THREE LEADING BOTANICAL PERIODICALS.

Botanical Register, edited by Dr. Lindley; each Number containing eight figures; coloured 4*s.*, plain 3*s.*, and corresponding letter-press.

Botanical Magazine, edited by Dr. Hooker, each Number containing eight plates, coloured 3*s.* 6*d.*, plain 3*s.*

British Flower Garden, edited by Mr. David Don, containing four plates, coloured 3*s.*, plain 2*s.* 3*d.*

Of these twenty monthly figures we have only selected such as are new, and are to be recommended for culture. For descriptions and figures, reference must be made to the works themselves.

NEW BERBERIDEÆ.

Berberis dealbata (Whitened Barberry).—A native of Mexico, whence it was obtained by the Horticultural Society. This remarkable species is an evergreen shrub, which is probably hardy. It is increased by layers, which will root in the course of a single season.—*Lindl. Bot. Reg.* 1750.

NEW ERICEÆ.

Rhododendron (Azalea) Indicum speciosum (Showy India Rosebay).—This splendid variety was raised at Coombe Wood, the seat of the late Earl of Liverpool, by Mr. William Smith. It was raised in 1830, from seeds obtained from *R. Indicum*, that had been impregnated with the pollen of *Phœniceum*. It is nearly hardy, and a very free flower, beginning to blossom about the first of May.—*Don, in Brit. Fl. Gard.* 284.

ASPHODELEÆ.

Dracœna terminalis. (The Sandwich Island Tee-Plant).—One of the most graceful of arborescent stove-plants, where there is sufficient height for it to rear its slender stem to the elevation of ten or twelve feet. In appearance it resembles a palm, and although, when its structure is carefully examined, it is found not to be one of that princely tribe, yet there can be no doubt that it seems to connect the chain of vegetation, by bringing the asparagus in contact with the cabbage palm.—*Lindl. in Bot. Reg.* 1749.

NEW AND BEAUTIFUL ORCHIDEÆ.

TRIBE VANDEÆ.

Maxillaria Deppii (Deppe's *Maxillaria*).—This very fine species was received by Mr. Loddiges, from Mr. Deppe, who gathered it near Xalapa, in New Spain. It has been figured previously by Messrs. Loddiges, in their *Botanical Cabinet*, page 1612.—*Curt. Bot. Mag.* 3395.

Monachanthus viridis (Green-flowered Cowlwort).—This is the original species on which the genus *Monachanthus* was founded. In habit it is so like *Catasetum tridentatum*, that it was long doubted whether it ought to be generically separated. It is a native of Brazil, growing upon trees in the Corcovado, whence Dr. Hooker received the drawing and specimen which first made the genus known. It requires the same treatment as *Catasetums.—Lindl. in Bot. Reg. fol.* 1752.

Brassia Lanceana (Mr. Lance's *Brassia*).—A native of Surinam, in woods, where it was found growing upon trees, by John Henry Lance, Esq., and by him presented to the Horticultural Society, in 1833. It is also wild in Brazil, where it was found by Dr. Von Martius, upon the trees on the banks of the river Jui, one of the tributaries of the Japurà, in the province of Rio Negro, flowering in February. It is a very tender species, and requires the hottest and dampest part of a stove. The flowers are bright yellow, spotted with brown, and very fragrant.—*Lindl. in Bot. Reg.* 1754.

TRIBE EPIDENDREÆ.

Lælia anceps (Two-edged Lælia).—A very beautiful kind, imported from Mexico by Messrs. Loddiges. The flowers are large, and of a purple-rose colour; and from Dr. Lindley's figure and character it appears one of the most interesting of the *Orchideæ* tribe. It will probably succeed, without difficulty, in any hothouse which is adapted for the cultivation of *Maxillarias*, and plants of that description. *Bot. Reg.* 1751.

TRIBE ARETHUSEÆ.

Pterostylis concinna (Neat *Pterostylis*).—This graceful little *orchideous* plant, like the majority of the species of this remarkable genus, is a native of the vicinity of Port Jackson, where it was discovered by Mr. Brown, and introduced to the Royal Gardens at Kew, by Mr. Allan Cunningham, in 1828.—*Hooker, in Bot. Mag.* 3400.

Pterostylis acuminata (Acuminated *Pterostylis*).—Another species of this singular Australian genus. It was also introduced by Mr. Allan Cunningham, from the neighbourhood of Port Jackson, in 1827. The flower is so large, in proportion to the size of the plant, as to render this one of the most striking of this genus yet known in cultivation. Flowers greenish-white.—*Hooker, in Bot. Mag.* 3401.

TRIBE OPHRYDEÆ.

Habenaria goodyeroides (Goodyera-like *Habenaria.*)—This is a rare and interesting, though not a very beautiful plant; it is a native of Bombay, and was introduced by J. Nimmo, Esq.—*Hooker, in Bot. Mag.* 3397.

PECULIARITIES OF PLANTS.

Our last remarks, Vol. I. page 54, related to those plants possessing the property of entrapping insects by their irritability, or by remarkable appendages attached to their leaves. We now come to others equally, if not more, destructive to the insect race, by having their stems, leaves, or flowers, or all three, covered with a viscous liquid; the insects settling upon such are unable to escape, every struggle entangling them more than the last.

Amongst these may be enumerated the *Robinia viscosa*, *Calceolaria viscosa*, several species of *Silene*, sweet-briar, common moss-rose, and the *Fraxinella*. The moss-rose has not only a stem thickly covered with the viscous liquid, but possesses a mossy coat, which, when not disfigured by dead insects, is, in every body's estimation, a great addition to its beauty. This beautiful variety is said to have been raised quite accidentally, by planting a common Provence rose in a very damp and shady situation; and it has been thought by some persons that any rose may be made mossy by constantly keeping it in the shade, and where the air is very damp for want of ventilation. This opinion we can by no means agree to, as a general rule, whatever might be done in a solitary instance.

Who does not know that, after a hot dry day, the common *Fraxinella* emits a resinous vapour, which will readily take fire, and burn freely, if a candle be introduced to it, without destroying the plant.

But leaving the subject of the *fly-catching* properties of plants; in viewing their peculiarities and metamorphoses the mind is led to things exceedingly curious. Many of the movements of plants are purely mechanical; others cannot be attributed to mechanism, because they are attended with phenomena exactly resembling muscular contractility in animals.

The *Hedysarum gyrans* is constantly in motion. These motions are thought to be connected with respiration. In the tiger-lily the pistillum will bend first towards one stamen and then towards another, until it has received the pollen from nearly all. In *Saxifraga* and *Parnassia* something of the same motion is observed with the stamina. The sensitive plant is very remarkable in its motions. The phenomena of sleeping and waking of many plants are well deserving of notice. M. Dutrochet has made some experiments, by way of ascertaining the real cause of this; and his observations have led him to the conclusion that the *sleeping*, *waking*, and *nutation* of plants, depend on the air contained in their air-organs, and take place in proportion to the quantity of that air.

OBSERVATIONS ON THE CONSTRUCTION OF HOT-HOUSE ROOFS,

WITH A DESCRIPTION AND PLAN OF A GREEN-HOUSE ERECTED AT CHATSWORTH; ALSO A SELECTION OF GREEN-HOUSE CREEPERS, WITH REMARKS UPON THEM.

For these few years past we have directed particular attention to the construction of all sorts of hot-houses and green-houses. In doing so, we have always had four things in view—namely, *utility*, *stability*, *convenience*, and, though last not least, *economy*.

Before we proceed to detail the different plans we have pursued, it may be well to mention the motives which induced us to commence the inquiry. For many years past it has been a bone of contention among practical men, as well as theorists, of what materials the roofs of hot-houses ought to consist. The advocates for metal contend that the advantages are great, when compared with wood, both in lightness and stability. Those who disapprove of these kind of roofs, object on account of the contraction and expansion of the metal, the difficulty, at certain seasons, in keeping them warm, and also of properly ventilating them; and others object only on account of the expense.

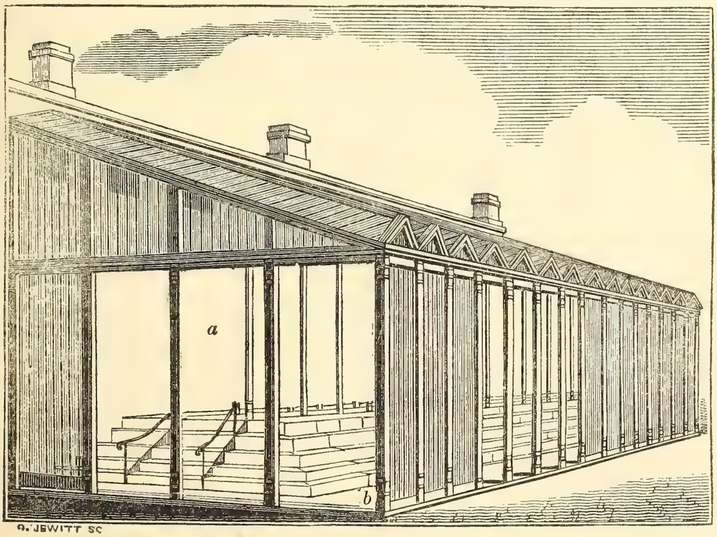
For our own parts, the expense has been one, and, we may say, the chief objection; for while we admit they are more difficult to keep warm in winter, and sometimes troublesome in summer, on account of their liability to become very hot rather suddenly, yet we have never been blind to the great advantage they possess with regard to light.

For several years we used all the ingenuity we possessed in endeavouring to make flat wooden roofs as light as possible, on account of their cheapness, and we certainly did succeed in making them much lighter than we remember to have seen them in any other place; but as we never mean from this time either to erect flat roofs ourselves, or recommend them to be erected by others, it will not be either interesting or useful to detail our numerous experiments.

About three years ago it occurred to us that wooden roofs would admit much more light, if the sashes were fixed in angles. We tried a small range of houses on this principle, with the sash bars fixed lengthways, the usual way, and rafters to bear up the lights. These houses were very light, and the plan appeared to possess several advantages,—1st, more morning and evening sun were received, and at an earlier hour than a flat roof-house; and, 2dly, the violence of the mid-day sun was mitigated by the disposition of the angled lights receiving the sun's rays in an oblique direction. Subsequent experience has led us to make several more alterations, such as doing away with rafters altogether, changing the longitudinal positions of the sash-bars, &c., as will be seen in the annexed engravings. We shall probably resume the subject next month, and offer some suggestions for further improvements; and shall proceed now to give a

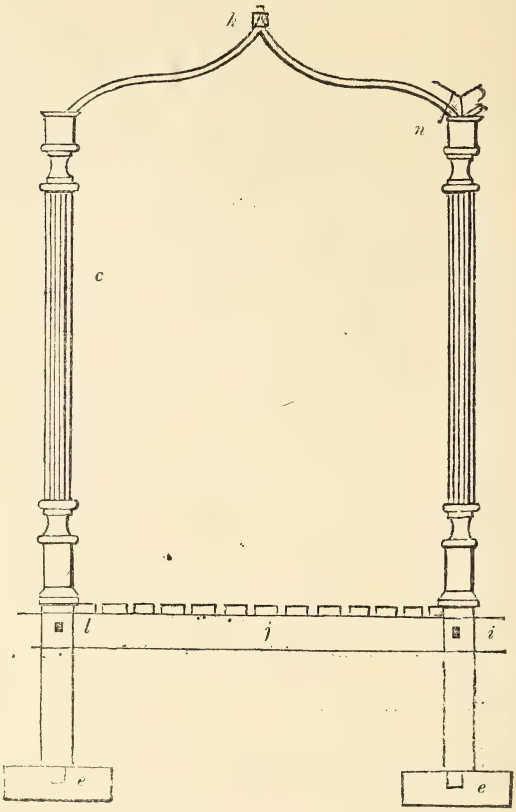
PLAN AND DESCRIPTION OF A NEW GREEN-HOUSE ERECTED AT CHATSWORTH, TOGETHER WITH A SELECTION OF GREEN-HOUSE CREEPERS, AND REMARKS ON THEIR CULTURE.

THE new green-house at Chatsworth is so constructed that scarcely any more light is obstructed than in a metal-roofed house, but it possesses at the same time all the advantages of wood.

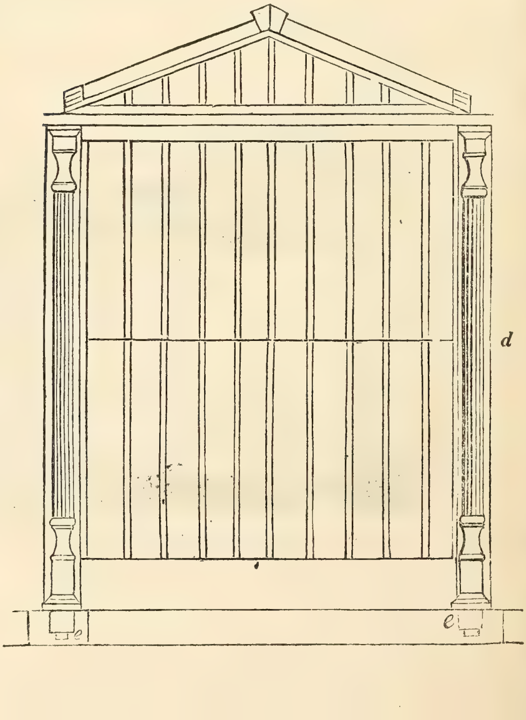


G. JEWITT SC

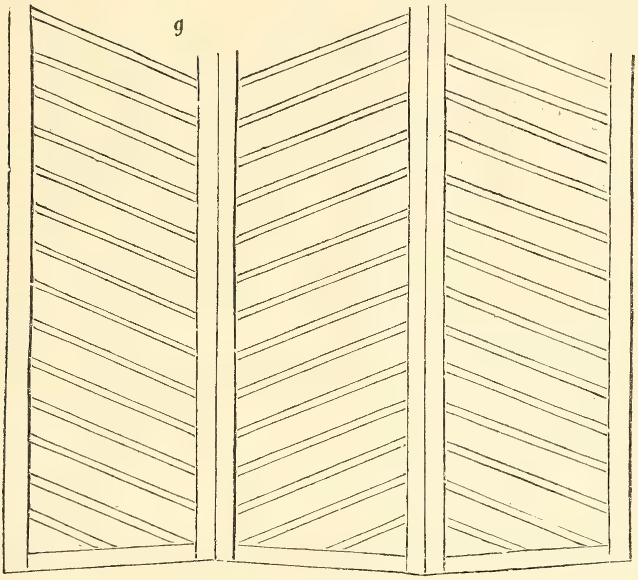
Its whole length is ninety-seven and a half feet, and its breadth from the back wall (*a*) to the front lights (*b*) twenty-six feet.

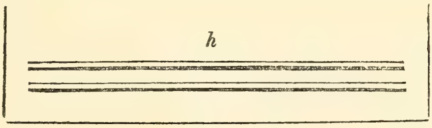


The roof is supported by two rows of cast iron pillars, one row along the front and end, as *d*, and the other along the centre of the house, as *c*. These pillars are placed six feet and a half apart in the rows, and are each three inches diameter; the front ones are made hollow, so as to admit a leaden pipe, which carries off the water from the roof into a drain laid in the gravel walk, on the outside of the house; this entirely does away with the appearance of a spout. At the bottom of the iron pillars there are socket (*e*) which are let into the stone, and give the pillars firmness, and through this socket the pipe descends into the drain.

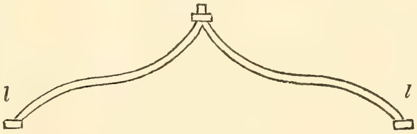


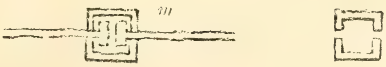
The elevation of the back wall is thirteen feet six inches, at the lowest part, and fifteen feet at the highest part, or ridge of the angle; the height in front is eight feet six inches in the valley, and ten feet to the ridge of the angle. The lights of the roof (*g*) are made fast, and fixed on angle-fashion; each light is twenty-five feet six inches long. All the front and end lights slide in a double groove (*h*), so that, although there is no door, a person may enter at any part of the house.



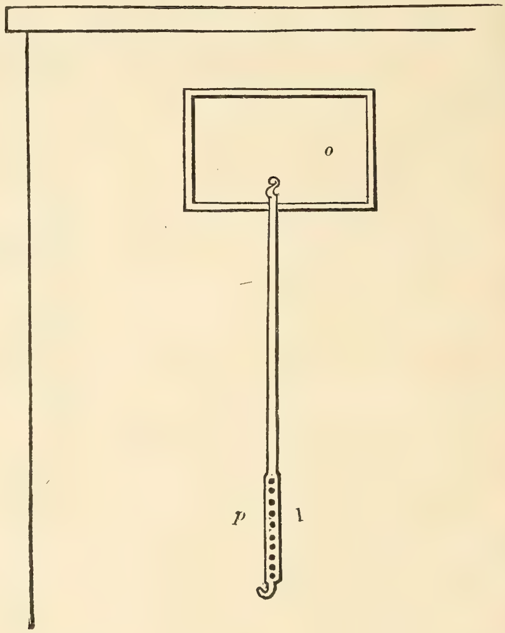


The centre row of pillars (*c*) are two feet six inches longer than the front or end pillars; about two feet from the bottom of each a small hole is left (*i*), through which a screw passes, to fasten the bearer which supports the centre walk (*j*). On the top of these pillars is also fixed another iron support (*k*), which is formed to rise up to the ridge of each angle; each of these arched supports have at their ends small square parts (*l*), which fix in a hollow left at the top of each pillar (*m*), and after being properly adjusted, they are fastened by running a little melted lead into the interstices.

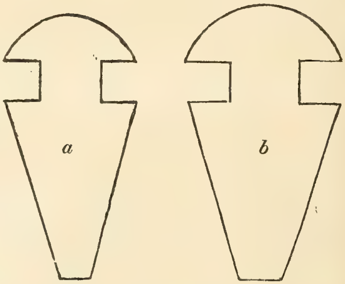




In each valley of the angles two large screws are inserted into the styles of the lights (*n*), to fasten them firm. Air is admitted by sliding the front sashes, and by ventilators in the back wall (*o*), which are made to swing on pivots, and open by means of long iron rods, having holes to fix on pins driven in the wall, so as to regulate the proportion of air at pleasure (*p*). To prevent these ventilators from being unsightly, a square piece of trellis-work is placed over the opening inside the house, as may be seen in the perspective view.



The sash bars, both of the roof and front lights do not obstruct much light, as from their size, shown in the sketch *a*, being the full size of the bars in the roof-sashes, and *b* the size of those in the front ones, very little shade can be made by them. The grooves where the glass fits in, prevents the putty shelling off, or the wet making its way betwixt the putty and wood, and the difficulty of glazing, when any squares are broken, is trifling.



The house is heated by four fires; the flue covers are dished, for the advantage of steaming. The two end flues run under the front walk, and meeting in the middle of the house, cross and discharge themselves at the two chimneys in the centre of the back wall; and the two centre flues pass under the centre walk, and discharge themselves at the two end chimneys.

The walks are three feet six inches wide, and are composed of bars of wood four inches broad, and an inch and a half thick, nailed half an inch apart upon strong bearers.

The price for the erection stands as follows:—deal wood, taking an average, including the scantling, &c., &c., will scarcely exceed 2½*d.* per foot; sawing the same, 4*s.* per hundred feet; workmanship, 2½*d.* per foot; glass, six inches by three, for the roof, 6*d.* per foot; glazing, 1½*d.* per foot; pillars of cast iron, 10*s.* per cwt.; front foundations, and the entire fitting up, as flues, &c., &c., depend entirely on local situation and other circumstances.

LIST OF CLIMBERS FOR THE GREENHOUSE.

The selection given below, with the remarks appended, will be found of great assistance to those who are wishing to plant creepers, and have not the opportunity or convenience of any ready reference, or are not acquainted with these kinds of plants. They are so arranged that a selection of colours may be made for any month or number of months, when a good show of flowers is a matter of importance.

Plants coming into Flower in February.

Maurandia antirrhiniflora.	These will either do for pillars or trellis; they flower freely from this time till October or November.
— Barclayana.	
— Semperflorens.	
Passiflora cærulea—racemosa—blue.	This sometimes flowers in June.

Plants coming into Flower in March.

Brachysema polymorpha.	This plant I do not know. It is recommended to me as excellent for a pillar.
Kennedya cordata—purple fl.	Does not climb so quick as some kinds, but makes a good show.
— Comptoniana—blue fl.	These are all very handsome, and where the height is not great they will soon cover the pillars against which they are planted.
— dilatata—purple fl.	
— heterophylla—purple fl.	
— inophylla—scarlet fl.	
— monophylla—purple fl.	
— prostrata—purple and red.	
— nigricans—dark purple.	
— rubicunda—brownish red.	
Ruscus androgymus—green and yellow.	A very curious plant.

Plants coming into Flower in April.

Rhodochiton volubile—dark purple.	A fine new creeper, nearly hardy.
Tropæolum pentaphyllum—orange fl.	Both these grow very rapidly, and flower very freely in April.
— polyphyllum.	
Bignonia Capensis—orange.	Continues flowering from April down to the beginning of September.
Clematis Massoniana—white fl.	Comes into flower towards the end, or early in May.
Brachysema latifolia—scarlet.	Is fond of heat, but will thrive well in the greenhouse.
Podolobium scandens—yellow.	Continues flowering till June.

Plants coming into Flower in May.

Billardiera angustifolia—yellow.	Continues flowering till August.
— longiflora—crimson.	A very free flower, and quick grower.
Caprifolium oblongifolium—scarlet.	Flowers most of the summer.
Cobæa scandens—blue-purple	Flowers all the summer.
Jasminum odoratissimum—yellow.	Both excellent climbers, well suited for trellis.
— volubile—white.	
Kennedya coccinea—scarlet.	Very showy when a fine plant.
Fuchsia macrostemma—scarlet.	These are not properly creepers, but they look exceedingly well trained up a pillar.
— gracilis—scarlet.	

Plants coming into Flower in June.

Manettia cordata—scarlet.	Beautiful new plant, fast grower.
Bignonia grandiflora—orange.	Requires a good deal of room.
Combretum farinosum—orange.	Does well on a trellis.
Fuchsia microphylla—red.	Suited for training either on trellis or a pillar.
Glycine heterophylla—yellow.	Suitable for trellis rather than pillars.
Jonesia scandens—orange.	Very good for trellis in a warm place.
Clematis odorata—white.	Rather scarce.
Lophospermum erubescens—rose-coloured.	Excellent for pillars.
Sollya heterophylla—blue.	The rich blue colour of the flowers, and the graceful manner in which they hang, render these plants very desirable.
— angustifolia—blue.	
Passiflora alato-cærulea—rose.	These two Passifloras are similar in the colour of flower, and are both very fine.
Tacsonia pinnatistipula—rose-coloured.	

Plants coming into Flower in July.

Glycine argentea—yellow.	
Eccremocarpus scaber—orange-red.	Two fine plants for pillars.
— longiflorus—yellow.	
Bignonia Cherii.	

Maurandia.—All the three species of *Maurandia* are nearly hardy. They thrive freely in any light rich soil, and are propagated freely by seeds which they produce in abundance; cuttings of the young wood also grow, if planted in light soil, and plunged in a little heat.

Passiflora.—All the green-house species of *Passiflora* require to be planted in a mixture of loam and peat; they are very handsome; bloom very freely. They may be propagated by cuttings of the young and tender shoots, planted in light soil, and plunged in a little heat.

Brachysema.—The *B. latifolia* is a most beautiful plant for a pillar or trellis. It does well planted out in equal parts of peat and sandy loam from a pasture field. They are propagated both by layers and cuttings; the latter should be planted in fine white sand, and be covered with a glass.

Kennedia.—All the species recommended above require to be planted in a mixture of sandy loam and peat, in the proportions of two-thirds of the former to one-third of the latter. Cuttings strike root easily, if planted in pots of light soil, and plunged in heat.

Ruscus androgynus.—Though many plants make a far greater show than this does, yet the curious manner in which its flowers are produced, and other peculiarities, render it well deserving a place in the greenhouse. It should be planted in equal parts of peat and loam; and may be increased by division of the roots and suckers.

Rhodochiton.—For the manner of treating, see *Magazine of Botany* for March, 1835, page 27.

Tropæolum.—The two species named above are very easy of culture, thriving in equal parts of peat and loam, and may be easily propagated by cuttings and seeds; the former strike very well with us, if planted in light soil or sand, and be plunged in a little heat.

Bignonia.—The two species noticed should be planted in an equal mixture of peat and sandy loam. Propagate by cuttings of the young wood, which should be planted in light soil, and plunged in heat.

Clematis.—These will grow in any light rich soil, and may be propagated by cuttings.

Billardiera.—These two species are of very easy culture, if planted in sandy loam and peat. They produce seeds, which should be sown in the spring; cuttings will also grow if planted in sand, and covered with a glass.

Podolobium.—The soil most suitable for these is two parts of very sandy peat, and one part of light loam. They are propagated by cuttings, taken off when half ripe, and planted in sand, and covered with a glass.

Caprifolium.—These require the most simple culture; any light rich soil will answer for them, and they may be very easily propagated by cuttings, plunged in a little heat.

Cobœa scandens.—This species will soon cover a very large space in the greenhouse; it produces an abundance of flowers, and, in general, plenty of seeds, by which it is easily propagated; it may also be increased readily by cuttings planted in light soil, and plunged in heat. Any light rich mould will suit it.

Jasminum.—These species may be planted in equal parts of loam, peat, and leaf mould, or very rotten dung. They are very easily propagated by cuttings of the young wood planted in sand, and covered with a glass.

Fuchsia.—A soil similar to that for the jasmine will suit these. They are easily propagated by cuttings of the young and tender shoots planted in sand, and plunged in a little heat, under glass.

Manettia.—The species recommended is of very easy culture, and grows very rapidly. It strikes freely from cuttings planted in sand, and placed under a hand-glass, in heat. The soil is sandy loam and peat.

Combretum.—The species recommended as a green-house climber must be planted in a warm situation, or it will not prosper. It thrives in a mixture of loam and peat, and is propagated by cuttings planted in pots of sand, and plunged in heat.

Glycine.—These are of easy culture, growing freely in any light rich mould. The *G. Sinensis* is a delightful plant for the trellis of a conservatory; in the open air the flowers are liable to be damaged with the early spring frosts, but in a house it continues flowering all summer.

Jonesia.—This, like the species of *Combretum,* must be planted in a warm situation in the green-house to do well; it thrives best in the stove. The mode of propagation is by cuttings, and the best soil is sandy peat and loam.

Lophospermum.—See page 27.

Sollya.—These are nearly hardy, and if planted in loam and peat will thrive very vigorously. They are readily increased by cuttings, planted in sand, and plunged in a little heat.

OPERATIONS FOR MAY.

Anemones.—The roots planted in October and November last year will now be in flower; if the weather be dry, water the beds about twice a week, until the flowers begin to fade; be careful that no water falls upon the expanded flowers. For the treatment of those planted in February, see page 18 of the current volume, rules 3 to 10.

Azaleas.—All the tender kinds, except those intended to bear seed, should be potted as soon as they have done flowering; the seed bearers must remain until that is ripe. For other treatment, see Vol. 1, p. 126.

Banksia.—The seeds of this plant may be still sown early in the month; about the end place the seed-pots close under a south wall, and cover them with a little moss. Vol. 1, page 120.

Brachysema latifolia.—May yet be struck by cuttings; plant them in sand, under a glass, and give them a little heat.

Boronia serulata.—Half ripened cuttings of this plant may be put in about the beginning or middle of the month; these must be planted in sand, under a bell or hand-glass, kept rather dry, or they will damp off. They will also now readily strike by layers. See Vol. 1, page 173.

Calceolarias.—About the beginning of the month the plants which were grown from seed the preceding spring, and have been kept through the winter in the green-house, should be removed to a cold frame for a while, to harden them gradually, previous to their being placed in the situations where they are intended to bloom. Vol. 1, page 248.

Clethra.—The various species of this genus may be propagated by cuttings of the half ripened wood any time this month. Vol. 1, page 233.

Cyclamen.—As soon as the *C. persicum* and its varieties have done flowering, and lost their leaves, take them out of the soil in which they grew, until September, when they should be planted again. Vol. 1, page 180.

Epacris.—The species of this genus may now be propagated by half ripened cuttings, planted in sand, under a bell-glass. Vol. 1, page 53.

Oxalis crenata, in pots, should now be turned out into the open ground. Vol. 1, page 230.

Protea.—Now is the time for planting cuttings of the half ripened wood in pots of sand, under bell or hand-glasses.

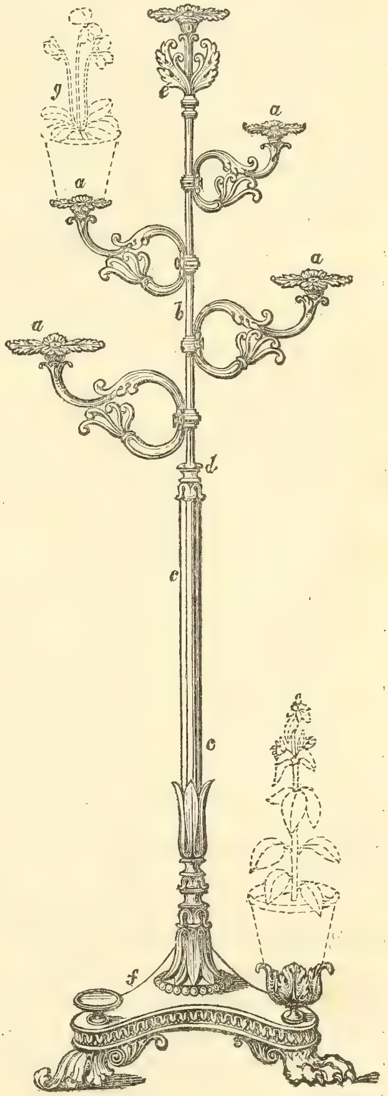
Rondeletia speciosa.—Cuttings of the half ripened wood now planted in pots of sand, and plunged in heat, will strike root.

Verbena melindris.—Cuttings of the young shoots should now be planted in pots of light soil. Vol. 1. page 174.

FIGURE AND DESCRIPTION OF AN ORNAMENTAL FLOWER-STAND.

DESIGNED BY MR. SAUL, OF LANCASTER.

THE very high state of perfection to which casting in iron has arrived, is taken advantage of for ornamental purposes. The present flower stand is worthy of notice, and will not be very expensive. There are four moveable brackets, *a, a, a, a,* which move round on the rod *b,* and may be placed any height and any figure that may please the possessor or suit the situation in which it is placed. The rod *b,* moves up and down in the pillar *c, e,* till the branch rests at the top of the pillar at *d.* The branch *e,* is moveable and may be taken off the rod, so that the brackets may be slipped off at the top, leaving only one or two according to the number of plants intended to be placed thereon. The number of brackets may vary according to the season of the year. The stand is bronzed, which gives it an elegant appearance, either fit for a drawing-room or any other place. Its whole weight is only twenty-six pounds, so that the cost is trifling, when the different moulds are in possession. The bottom part *f,* is made with different kinds of ornaments, to suit the taste of the purchaser. The pots *g, g,* are merely placed to show that they rest on the leaves fixed at the ends of the brackets.



PRESERVATION OF PLANTS, ETC. ON A SEA VOYAGE.

The chests in which plants are sent from the Botanic Garden, Calcutta, to Europe, or other distant parts of the world, are made of strong materials, and fitted out in such a manner, with moveable railed frames and covers, as to admit of their being easily sheltered from the access of sea water, wind, and rain. Besides a number of plants placed in them, and fastened to their sides, the earth is generally mixed with a considerable portion of seeds, calculated to germinate successively during the progress of the voyage, and thus to enhance the value of these collections. The chance, however, of their arriving safely at their destination, rests almost entirely on the commander of the ship in which they are proceeding, and on the person who is so good as to undertake the immediate charge of them on the voyage, directing their kind solicitude towards protecting the plants from the least contact with salt water, from injury being done by vermin, poultry, &c., and from the habit which idle people sometimes indulge in, of breaking or pulling off the leaves, branches, or flowers. Where such a favourable disposition exists, a strict attention to the following rules will ensure a complete success, and the greatest proportion of the plants will arrive at their destination in a thriving and vigorous condition.

1. It is proper to keep the chests uncovered the greatest part of the day in fair and moderate weather, particularly during gentle rains; or if these should be heavy, or of long continuance, until the plants have been sufficiently refreshed. In very hot weather, their lids must be alternately shut up. It is extremely important that the chests should remain open at night also; and this rule ought always to be attended to in fair weather, provided that the plants are not thereby exposed to the attacks of rats and mice, &c.

2. It is obvious that the plants require to be watered frequently, but at the same time it must be observed, that too much moisture would do as much harm as too little would: the safest plan is this,—to give them water only when it is found that they stand in need of it, and the best time for doing so is in the evening.

The quantity of water must, in a great measure, be regulated by the state of the weather, though not exclusively. They want much less in a cold than in a hot climate. If care is taken to keep the chests shut up during the hottest part of the day, less water will be requisite than otherwise. Whenever the leaves and branches look drooping and relaxed, especially towards the evening (for in hot climates they will generally appear in that state in the middle of the day), and the earth appears dry, it is a sign a little water is necessary; and the best mode of applying it is, to pour or sprinkle it over them in such a manner that the branches and leaves, as well as the earth, may become gently moistened. It ought to be a general rule, never to let the plants get water oftener than once a day, and not to give any at all if the earth appears quite wet.

3. Directions where to place the chests to the greatest advantage, depend on the size and accommodations of the ship, and can only be given in a general manner by observing, that they should be sheltered from strong winds and burning sunshine, as far above the reach of the sea, as is compatible with the care and vigilance which they require; and that day-light, as well as a free circulation of air, are indispensably necessary for the preservation of the plants. The *poop*, above or near the entrance to the cabin, answers generally best. The importance of preventing salt water from reaching the plants, has been repeatedly hinted at above; indeed, too much precaution cannot be taken with respect to it, as the least accident from that source generally proves fatal, unless recourse is directly had to washing the leaves or branches which have suffered, with a wet sponge, or a soft piece of linen.

When the seamen are cleaning the decks the danger is greatest, for it is difficult to prevent them from dashing the sea water against the chests, when some part of it, in all probability, will reach the plants. As an additional guard against this danger, a tarpaulin might be thrown over them while shut up, which would also be of use in stormy and bad weather. Raising the chests to some height above the surface of the decks might also be of great use.

4. Chests of roots, and parcels or boxes of seeds, should be put in a dry and cool place in the ship, where the air is constantly circulating and renewed: the latter may advantageously be hung up under the roof of a cabin, or put in a trunk among books or clothes; and it would materially contribute to their preservation, if they were put out, occasionally, in the open air, especially if the least sign of dampness should be visible on them. Placing such packages of roots or seeds in the ship's hold, or shutting them up in chests, or places likely to become hot, damp, or wet, would infallibly prove destructive to their vegetative principle, and kill them in a very short time.

A FEW REMARKS ON SOME GENERA OF THE ORDER ERICEA.

THESE beautiful plants grow in great abundance at the Cape of Good Hope, where they cover immense tracts of land. They are also common in North and South America and in some parts of Europe. In Northern Asia, and India, they are not common, and in Australasia they are scarely known, but their place is supplied the plant of the *Epacris* Tribe. (*Epacrideæ.*)

As to their properties some have medicinal properties of no inferior quality. The berries of the succulent fruited kinds are usually grateful, and are sometimes taken as food, such as the *Gaultheria shallon* and *procumbens, Brossæa coccinea, Vaccinium myrtillus,* &c. &c. In the Island of Corsica an agreeable wine is said to be made from the berries of *Arbutus unedo.* The fruit, however, taken in too great quantities is said to be narcotic, and there is no doubt but a similar quality exists in several other plants of this order. *Rhododendron ponticum* and *maximum, Kalmia latifolia,* and some others are well known to be venomous.

The shoots of *Andromeda ovalifolia* poison goats in Nepal. Dr. Barton states in the American Philosophical Transactions, that in the autumn of 1790, the honey collected near Philadelphia proved fatal to many. The honey collected from our common heath does not appear to possess any pernicious qualities, of which we have daily experience.

The Order contains upwards of 30 genera and nearly a thousand species, the greater part of which are greenhouse plants, only about three hundred being hardy in this country. They are nearly all deserving of cultivation, many of them delicate, some really beautiful.

ARCTOSTAPHYLOS. This genus contains but two species, both of which are natives of Britain. The Bears-Grape or Uva-ursi grows in abundance on our moors. The other species (*alpina*) is chiefly confined to the mountains of Scotland, and can only be made to thrive in our gardens by being planted in moist shady situations. They both require sandy peat earth, and are propagated by cuttings and layers with very little trouble.

BROSSÆA. This genus contains but one species, native of South America, and consequently an inhabitant of our stoves. It thrives in a mixture of sandy loan and peat. Young cuttings will root planted in sand under a glass, and plunged in heat.

LYONIA. All the species are perfectly hardy, they require to be grown in sandy peat, are propagated by layers, and in all respects may be treated like the hardy Andromedas Vol. 1, page

MYLOCARPUM or Buck Wheat Tree. This genus contains only one species, the *ligustrinum,* which has much of the habit of *clethra.* It grows about eight feet high, and requires the shelter of a conservatory or pit. It is propagated by layers or cuttings planted in sand under a glass. The best soil for it is peat and loam.

CYRILLA. The two species of this genus are very pretty greenhouse shrubs, growing about six feet high: they will thrive in equal parts of loam and peat, and may be propagated by cuttings planted in sand, under a hand or bell-glass, but do not root very freely.

ELLIOTTIA. There is but one species belonging to this genus, which is well worthy of cultivation. It is a native of Georgia; it grows in sandy peat, and is increased by layers.

BLÆRIA. This genus differs little in habit from the *Erica.* All the species are natives of the Cape of Good Hope, and, therefore, require the shelter of the greenhouse. They may be propagated by young cuttings, planted in sand under a bell-glass, and placed in a shaded situation, without moist heat.

SYMPIEZA requires the same treatment as *Blœria.*

MENZIESIA. These have all much of the habit of the *Erica,* and require similar treatment. The usual method of propagating is by layers and seeds. All the species are perfectly hardy.

CULTURE OF THE MUSA SAPIENTA AND PARASIDIACA.

1. The culture of the Musa is attended with little trouble. After taking off the suckers, plant them in large pots, in a soil composed of one-third of rich sandy loam, and two thirds of a mixture of vegetable mould, well rotted dung, and sandy peat.

2. Give them, whilst young, a temperature of from sixty to seventy degrees.

3. When they come into flower, apply the pollen to the stigma, by means of a small feather. This should be done when the air of the house is pretty dry, and then they not uncommonly produce their fruit pretty well.

4. Never cut off any of the leaves until they become somewhat withered, for if cut off too soon the plants will bleed exceedingly, and the growth of the succeeding leaves is thereby retarded.

5. The leaves are also very easily split, which, if done, greatly retards the growth; be careful, therefore, to preserve them as entire as possible.

6. After impregnation place them in a warm part of the stove, where they will receive from seventy to eighty-five degrees of heat. They do not necessarily require bottom heat, although when bearing fruit, they thrive well with it, but they never do really well, when the pots are kept constantly plunged.

7. Give them plenty of air in fine mild weather, but never suffer them to be exposed to any direct current, or the leaves are liable to be injured both by laceration and being parched.

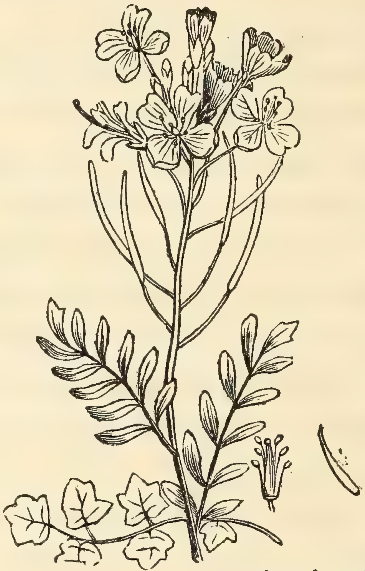
8. They require a good supply of water at their roots, to make them grow to perfection, and particular attention is necessary in this, to bring their fruit to maturity. Syringing over the leaves every day in summer, is exceedingly beneficial.

9. Always in potting give them abundance of room at their roots, for any cramping will stop their growth.

When in a healthy growing state the leaves of the paradisiaca will grow eight or nine feet long, and the *Musa sapienta* something larger.

CULTURE OF THE GENUS CARDAMINE.

There are not many species of this genus worth cultivating; upwards of forty species are known. The *C. pratensis,* or common cuckoo-flower, is known almost to every body. A pretty double species is deservedly cultivated in our gardens. The sorts most worthy of notice are the following: *thalictroides, pratensis plena, latifolia, chelidonia, macrophylla, amara, trifolia, uliginosa, bellidifolia, bellidifolia alpina, glauca,* and *asarifolia.*



The *asarifolia, bellidifolia, trifolia, macrophylla, glauca, chelidonia,* and *thalictroides,* are perennial herbaceous plants, and are remarkably easy of cultivation. They like damp situations, and indeed, this is the character of the whole genus, some of them being nearly, if not altogether, aquatics. Any common light soil will suit them, and they may be readily increased by dividing the roots.

The *pratensis plena, latifolia, amara,* and *uliginosa,* if grown in pots, should be set in pans of water; but if grown in the open ground, select as wet situations for them as can be found. They may be propagated easily by division like the last.

REVIEW.

The Hand-Book of Plain Botany; or Linnæan Lessons on Common Plants, for Field and Garden Practice. By J. Rennie, A.M., &c. 18mo. 2*s.* 170 pp.

All the "Alphabets" and "Hand-Books," on different branches of science, by Professor Rennie, which have fallen into our hands, are excellent. This Hand-Book of Plain Botany will, no doubt, be very extensively circulated, for with a little application a person may, without any other instructor, gain in a short time a good rudimental knowledge of the science, on the system adopted by Linnæus.

The work is illustrated by numerous wood-cuts, and is cheap at the price. The nature of it may be best understood by the following extract on

"*The readiest way of beginning the Study.*—By learning about a dozen terms, and being able to number as far as thirty, which every child can do, any boy or girl may, in the course of one summer, get a tolerable knowledge of two or three hundred plants, and be taught to assign these to their proper classes and orders in the system of Linnæus.

"The best way to learn the dozen terms is to get any flower, such as a lily, a primrose, or a buttercup, and have somebody who knows the several parts, and their names, to go ove them once and again, naming them each time till the pupil has them perfect.

"*The twelve main terms of Botany.*

"1. On the outside of the primrose a green sort of cup is seen, in which the coloured part stands as an egg does in an egg-cup. This the learner may call the *flower-cup*, but botanists call it by the Greek name, *Calyx.*

"2. Within this flower-cup, or calyx, which may be cut off to show what it contains, is seen the coloured part of the flower, the part, I mean, which is yellow in the primrose, blue in the violet, and red in the rose. The learner may call the coloured part the *blossom*, but botanists call it by the Latin name, *Corolla.*

"3. The blossom, or corolla, may now be cut off, when it will be seen in the primrose to be of one piece, while in the rose and other flowers it is of several pieces or leaves. The learner may call each of the pieces a *flower-leaf*, but botanists call it a *Petal.*

"4. Within the flower-leaf, or *petal*, in the primrose, fine small bodies may be seen standing round in a circle, with little tips somewhat shaped like a barley-corn, though not nearly so large, and a slender stalk to support these. Each of the fine small bodies the learner may call a *male*, but botanists call it a *Stamen.*

"5. The male part, or *stamen*, has two parts, an under and an upper part. The learner may call the under part the *stalk*, but botanists call it the *Filament.*

"6. The learner may call the upper part of the male the *tip*, but botanists call it the *Anther.*

"7. When the tip, or *anther*, of the male is broken or bursts, as it always does of itself as soon as it is ripe, a coloured powder is seen, which the learner may call the *tip-dust*, but botanists call it *Pollen.*

"8. When the calyx, the corolla, and the stamens are all cut away, the centre part of the flower alone will remain on the top of the stem. This part the learner may call the *female*, but botanists call it the *Pistil.*

"9. The female, or *pistil*, may be said to consist of a base, a middle, and a top. The base of the pistil is always more or less bulged out, and from its containing the seeds the learner may call it the *seed-organ*, but botanists call it the *Ovary.*

"10. The middle of the pistil the learner may call the *pillar*, but botanists call it the *Style.*

"11. The top of the pistil the learner may call the summit, but botanists call it the *Stigma.*

"12. The learner does not absolutely require to be taught any particular terms about the leaves, the branches, the stems, and the roots, though the common books on botany have some hundreds of these. There is only one more term which I shall mention at present, and which applies to a peculiar sort of leaf—sometimes according to the sort of plant found on the flower-stem, often at the base of leaves, and sometimes surrounding fruits, as the calyx does the corolla. This, which botanists call by more than one name, according to its situation, I shall, for the ease and convenience of the learner, call the *Scale*.

"Now these dozen terms—

1. Calyx,
2. Corolla,
3. Petal,
4. Stamen,
5. Filament,
6. Anther,
7. Pollen,
8. Pistil,
9. Ovary,
10. Style,
11. Stigma,
12. Scale,

are all which I shall trouble the learner to get perfectly, to begin with. One or two others, but not, I think, more than half a dozen, may be wanted as we proceed, and these I shall explain as they occur.

"It will make it easier for the learner to master these dozen terms, to consider the several parts as placed in five circles, one within the other.

"On the *outer* circle place the *scale,* whether it be leaf-scale, flower-scale, or fruit-scale.

"On the *second* circle place the flower-cup, or *calyx,* whether it consists of one piece or several pieces.

"On the *third* circle place the blossom, or *corolla,* whether it consists of one *petal* or several.

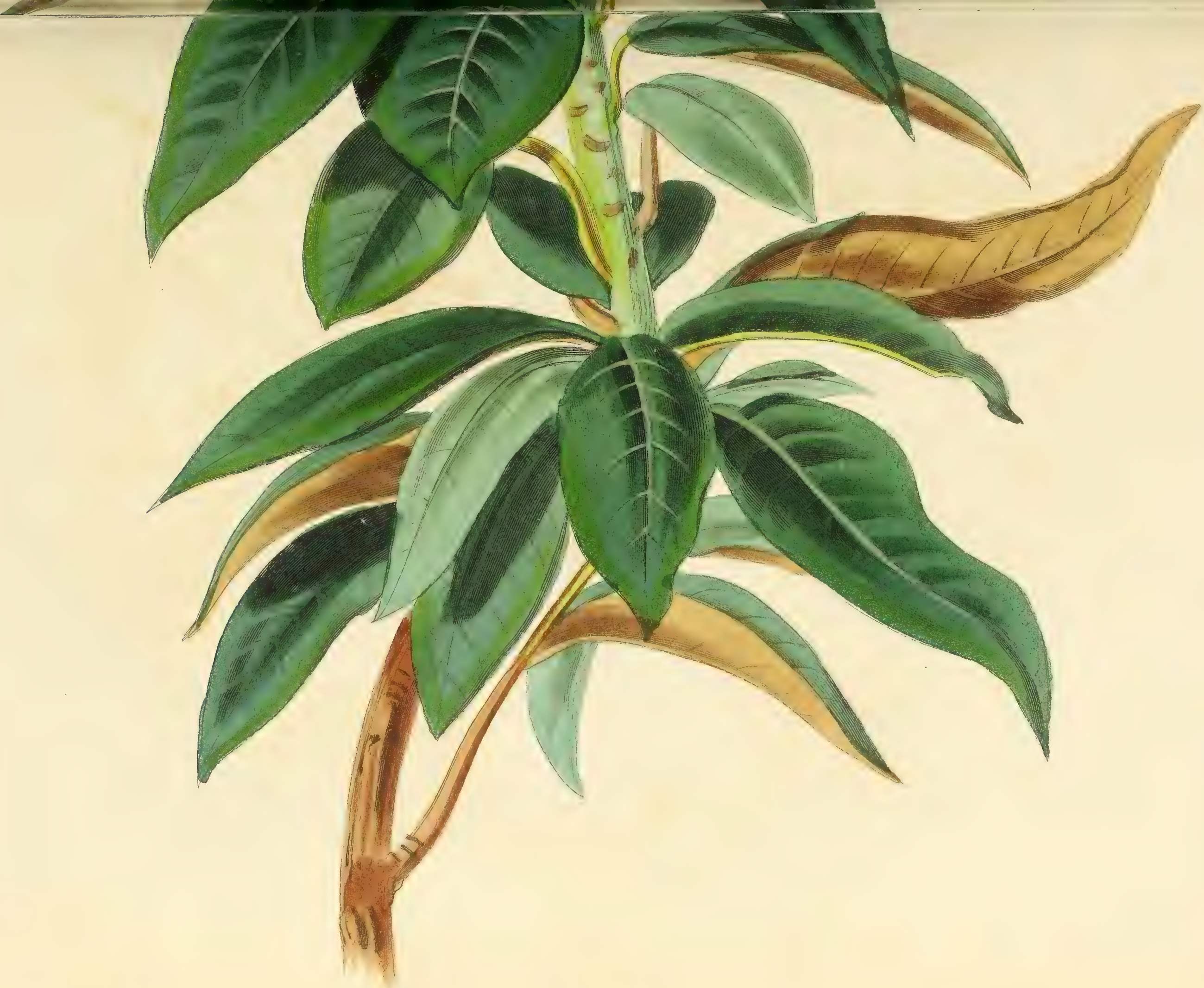
"On the *fourth* circle place the males or *stamens,* whatever be their number, with their stalks or *filaments,* and their tips, or *anthers,* containing the tip dust, or *pollen*.

"On the inner circle place the female part, or *pistil,* with the seed-organ, or *ovary,* at the base, the pillar, or *style,* in the middle, and the summit, or *stigma,* on the top.

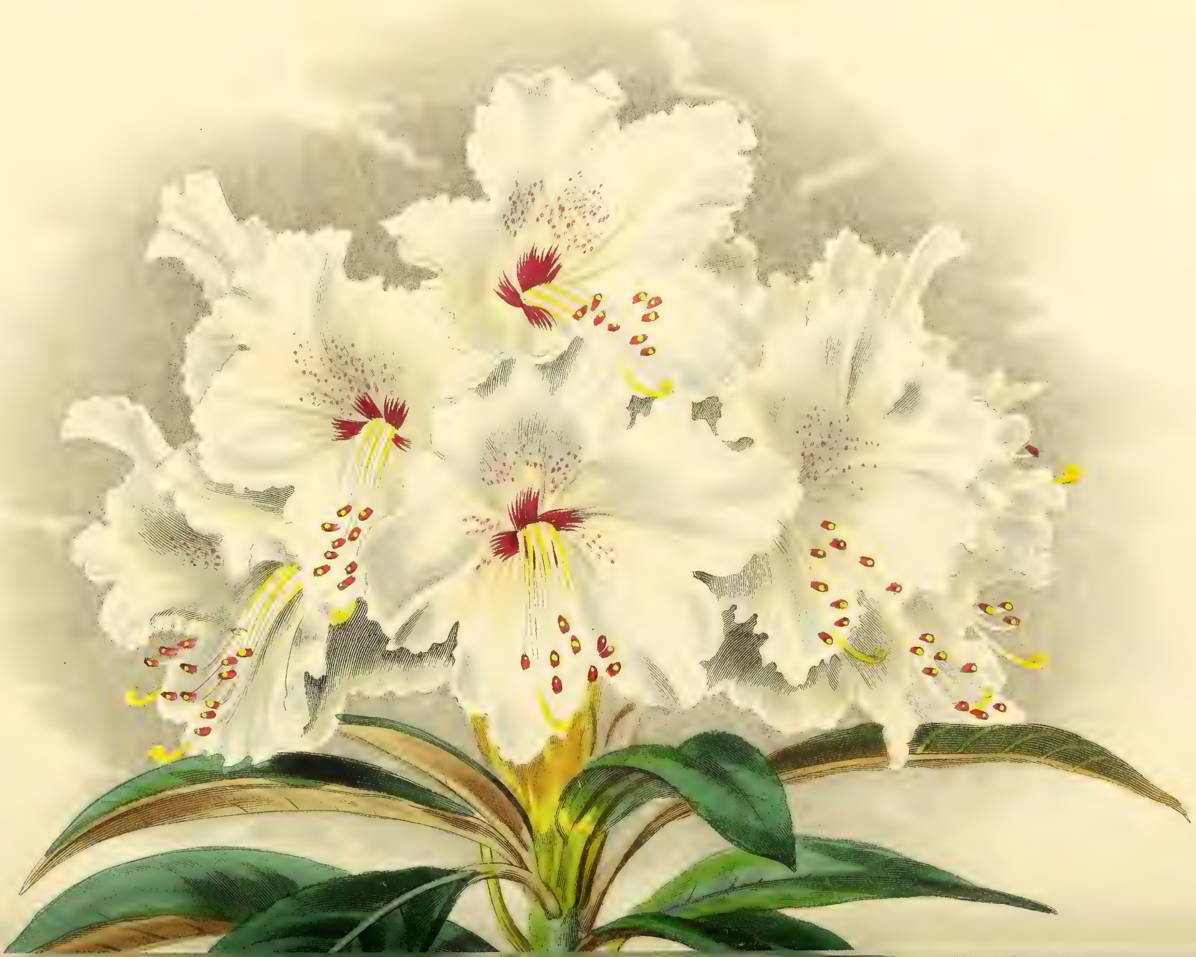
"When the learner examines any flower, these five circles must be kept in mind, and the parts placed on each of them must be examined in their order, beginning with the outer circle.

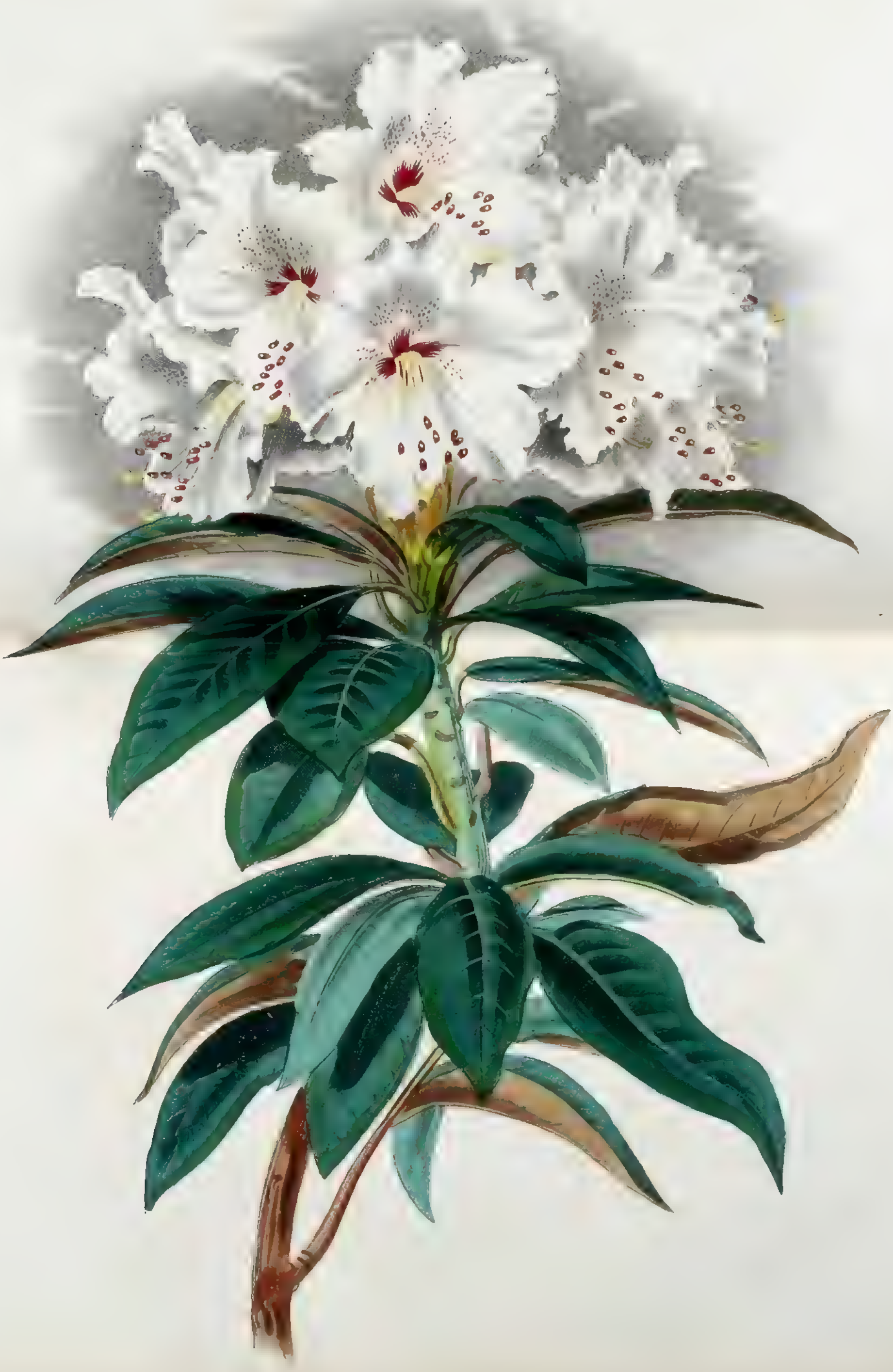
"It will sometimes happen, however, that all the parts belonging to the five circles will not be found; but after a little experience, the learner will easily distinguish whether it be the *calyx* or the *corolla,* or any other part which is wanting to complete all the circles.

"The dozen terms having been got perfectly, by going over them once and again, as well as the order in which the parts of the flower are placed on the five circles, the learner may next be taught how to find the class in which any flower is ranked by Linnæus."

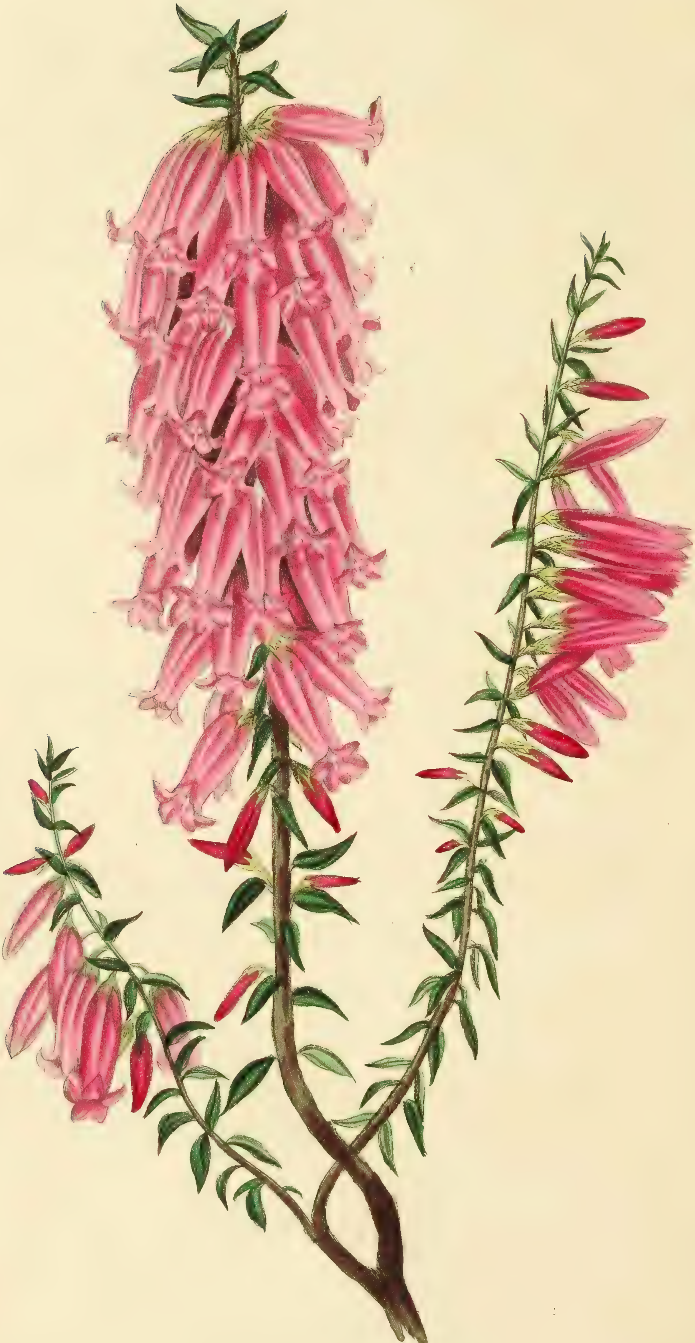


Rhododendron Arborical.





Rhododendron Arborica



F.W. Smith. del et sc.

Epacris Impreſsa

EPACRIS IMPRESSA.

(IMPRESSED EPACRIS.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
EPACRIDEÆ.

GENERIC CHARACTER.—See Vol. 1, p. 52.

SPECIFIC CHARACTER.—A shrub, from three to five feet high. *Branches* downy. *Leaves* ovate-lanceolate, ending in a sharp point. *Flowers* pendulous, rather large for the size of the leaf. *Corolla* tube three times the length of the *Calyx*, beautiful rose colour, the limb divided into five acute segments.

THIS plant is a native of Van Diemen's Land, and the south coast of New Holland, from whence it was introduced, in 1825, by Messrs. Mackey, nurserymen, of Clapton, Mr. Baxter, their collector, having furnished them with seeds of it.

The usual time of flowering is in the beginning of March, and it continues to ornament the green-house for several months. Our drawing was made in March from a beautiful plant.

It requires the shelter of the green-house, and precisely the same kind of treatment as that recommended for the *E. grandiflora,* Vol. 1, p. 52; and is propagated by half ripened cuttings, planted in sand, and covered with a bell-glass.

RHODODENDRON ARBOREA FIMBRIATA.

(WHITE-FRINGED TREE RHODODENDRON.)

CLASS.	ORDER.
DECANDRIA.	MONOGYNIA.

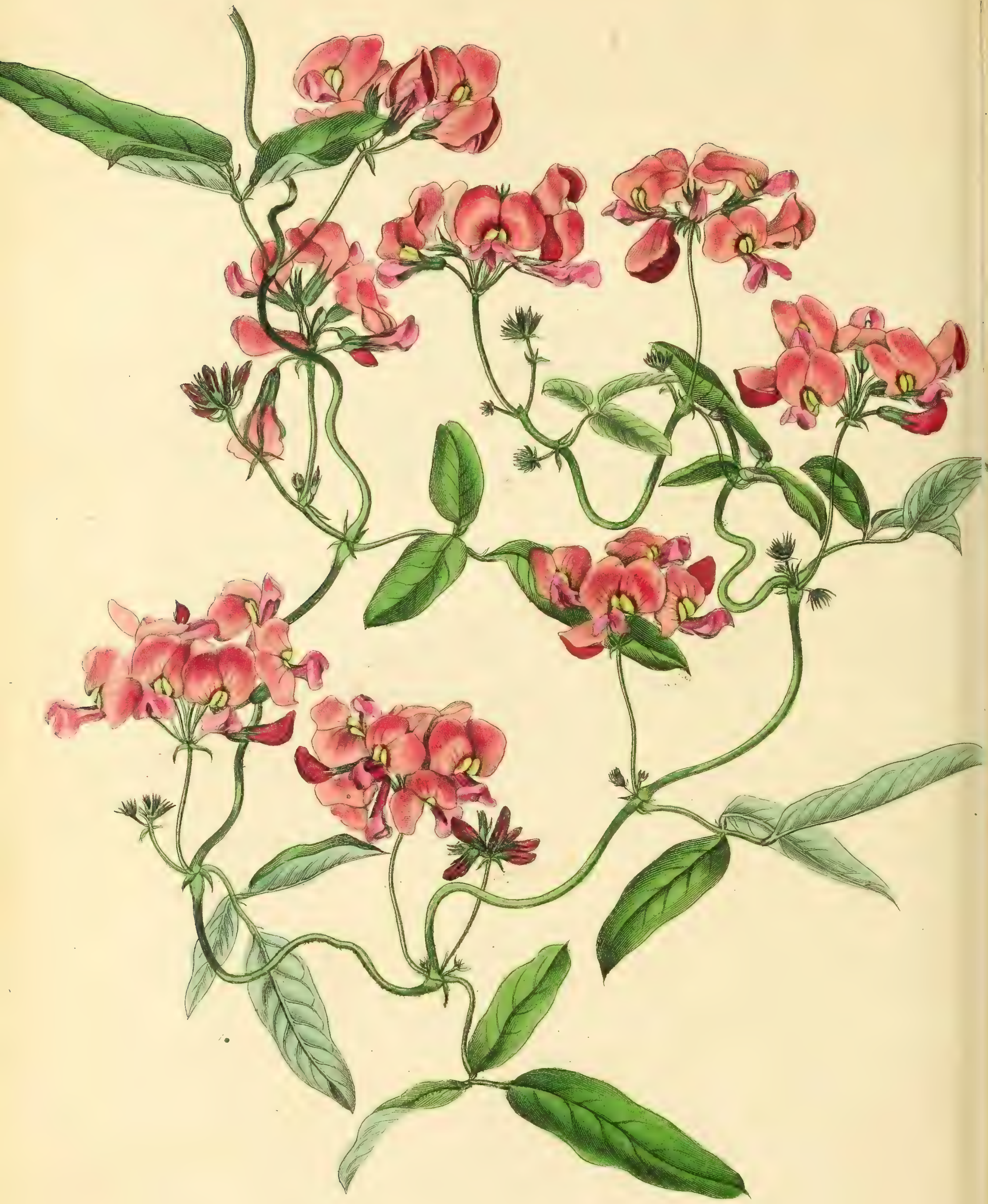
NATURAL ORDER.
ERICEÆ.

Generic and Specific Characters.—Vol. 1, p. 101.

Variety.—Tree-like, bark rugged, soft and tuberous, like the *Arborea. Leaves* ovate-lanceolate, acute, somewhat rusty beneath, but differs in this respect very materially from the *Arborea alba. Flowers* pure white, slightly spotted with purple. *Corolla* edges much fringed.

This beautiful plant was raised some years ago, by Mr. Knight, King's Road, Chelsea, from seeds of the splendid crimson species, which Dr. Wallich describes as growing on the Himalaya mountains. The singular deviation of the flower from that of its parent is the more surprising, as Mr. Knight informs us that no impregnation with the *Arborea alba* of that country could have taken place, the *white* not having flowered for some years after the seed was saved. This variety is most decidedly distinct from the well-known white, and we are not aware that it has been previously figured. It flowers in March and April.

Our drawing was taken in Mr. Knight's nursery, in whose possession we believe it alone exists.



F.W.Smith. del. et sc.

Kennedea coccinea elegans

KENNEDIA COCCINEA ELEGANS.

(ELEGANT SCARLET KENNEDIA.)

CLASS.
DIADELPHIA.

ORDER.
DECANDRIA.

NATURAL ORDER.
LEGUMINOSÆ.

Generic Character.—*Calyx* two-lipped, upper two-toothed, lower three-toothed. *Corolla* papilionaceous, upper petal (*vexillum*) bent back. *Wings* pressed close to the keel. *Legume* linear, compressed.

Specific Character.—A climbing shrub, ten to twelve feet high. *Leaves* in threes (*ternate*). *Leaflets* betwixt oblong and egg-shaped. *Flowers* in bunches. *Calyx* brownish-green. *Corolla* showy, upper petal bright orange-scarlet with a yellow base. *Wings* carmine colour. *Keel* purple-brown, covered with the wings. *Pods* smoothish.

Variety elegans.—Whole of the *Corolla* a bright orange-scarlet, and other differences, as seen on the plate.

This is a charming variety of the *K. coccinea,* and deserves the most extensive cultivation. It grows delicate, and is well suited for climbing up a pillar in a conservatory, where it will flower to perfection. A mixture of sandy loam and peat is the best compost for it. It strikes freely from cuttings in sand under a bell glass, and the pots plunged in a little hea

UPON THE APPLICATION OF HOT WATER IN HEATING HOT-HOUSES.

BY MR. THOMAS TREDGOLD.

Extracted from his Paper read before the London Horticultural Society, August 5, 1828, and inserted in their "Transactions," Vol. 7, p. 568.

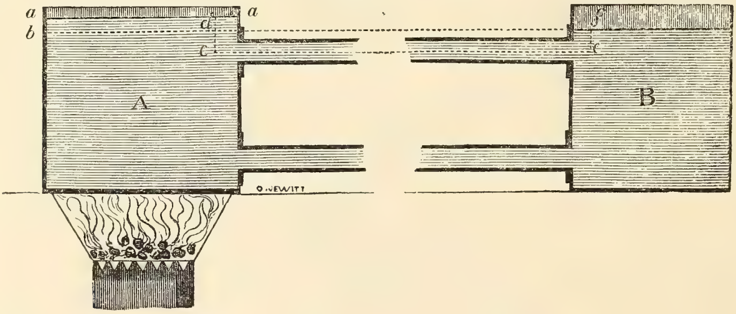
The power of imitating other climes and other seasons than those which nature affords us, is known and valued as it ought to be; yet it remains difficult even to imagine the extent to which this power may be applied. In this age it produces luxuries of which few can enjoy more than the commonest species; but in the next, nay, even in our own, there is a reasonable expectation of a considerable addition to the quantity and quality of those artificial productions, as well as to the best sources of pleasure and information they afford to the admirers and students of nature.

The obvious advantages of the hot water system are,—1st, the mild and equal temperature it produces, for the hot surface cannot be hotter than boiling water; 2nd, the power of heating such a body of water as will preserve the temperature of the house many hours without attention; and, 3rd, the freedom from smoke, or other effluvia of smoke flues. In houses appropriated to plants, these advantages are most important.

In order to develop the principles on which a hot-water apparatus acts, we may select the simple case of two vessels placed on an horizontal plane, with two pipes to connect them; the vessels being open at the top, and the one pipe connecting the lower parts of the vessels, and the other their upper parts.

If the vessels and pipes be filled with water, as fig. 1, and heat be applied to vessel A, the effects of heat will expand the water in the vessel A, and its surface will, in consequence, rise to a higher level (*a*, *a*), the former general level surface being *b b*.

Fig. 1.

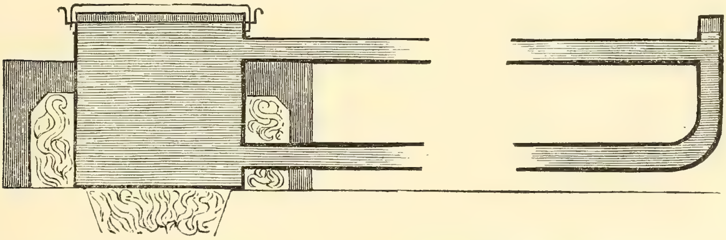


The density of the fluid in the vessel A will also decrease in consequence of its expansion; but as soon as the column *c d* of fluid above the centre of the upper pipe is of a greater weight than the column *f e*, above that centre, motion will commence along the upper pipe from A to B, and the change this motion produces in the equilibrium of the fluid will cause a corresponding motion in the lower pipe from B to A, and in short pipes the motion will obviously continue till the temperature be nearly the same in both vessels; or if the water be made to boil in A, it may also be boiling hot in B, because ebullition in A will assist the motion

The causes which tend to retard the motion of water in the pipes are—1st, the contraction of the moving fluid at the orifice of the pipes; 2nd, the friction of the fluid in the pipes, which sets the limit to the distance to which the pipes can be extended to produce the proper quantity of useful effect; but it is remarkable that the higher the temperature of the moving fluid, the less its friction; 3rd, the motion is retarded by the cooling of the fluid, in its progress along the pipes, such cooling having a tendency to produce a double current; and, 4th, by bends and changes of form.

It will be evident to any person of philosophical research, however, that in considering water the only liquid capable of being employed, we should be losing sight of one of the greatest advantages resulting from the knowledge of natural phenomena, for all liquids expand by heat; and hence, in all of them its partial application would produce motion under proper circumstances; while the boiling points of different liquids are at such different temperatures that we may vary the ultimate temperature of the heating surface from 100 to 600 degrees, that of water being 212 degrees. This mode of considering the subject opens a new source of speculation and improvement.

Fig. 2.



From the common principles of hydrostatics and the equations obtained, the following practical deductions may be derived:—

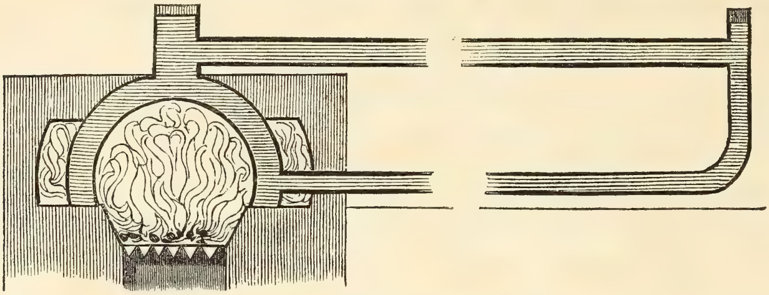
1st. The more expansible the liquid is, by a given change of temperature, the greater will be the velocity.

2ndly. All other things being the same, the velocity will be increased in proportion to the square root of the depth of the boiler; therefore, in a boiler four times as deep the velocity will be doubled.

3rdly. If there be a sufficient service of pipe for the object required, a reservoir is not necessary to the motion of the water: a simple bent pipe, fig. 2, being all that is essential to motion; the reservoir is only to reserve a hot mass of water to maintain the heat after the fire has gone out.

4thly. If a boiler have sufficient surface to receive the effect of the fire, and the whole apparatus contain as much water as will convey the heat from the fire to the heating surface in the time corresponding to its velocity, its capacity need not be further increased, except as a reservoir of heat, to act when the fire ceases to burn, as fig. 3.

Fig. 3.



5thly. Where heat is required only during the action of fire, a large surface in proportion to its capacity may be used with advantage, to give off heat over the descending pipe; figures 4 and 5, cooling in this manner, will increase the velocity.

6thly. The aperture of the upper pipe should not be more than about an inch below the surface of the water, or as much as prevents its drawing air in an open boiler; but the lower it is below that, the less effect will be obtained; the lower pipe should enter the boiler where it has least tendency to cool, and check the fluid rising to the upper pipe from the fire surface.

Fig. 4.

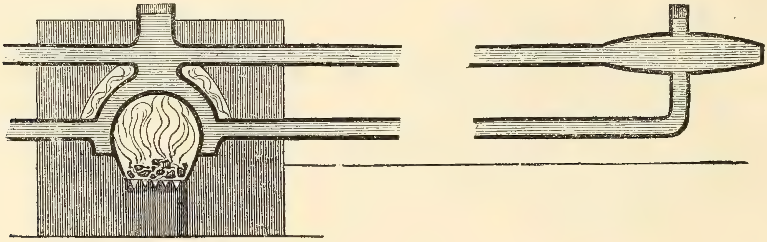
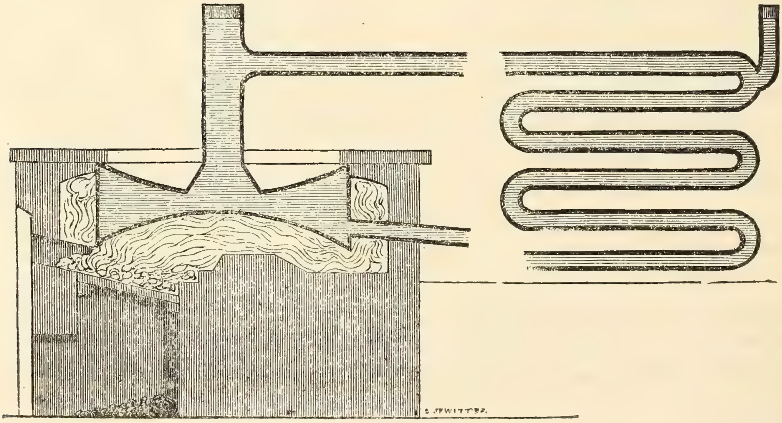
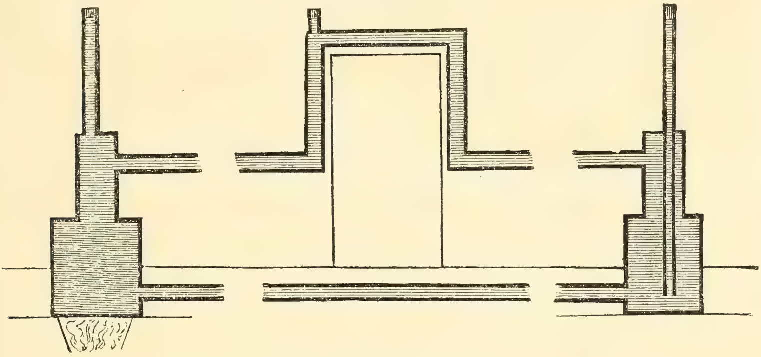


Fig. 5.



7thly. In a close boiler a pipe may, at any distance from the boiler, rise to any height and descend again; but it must neither rise twice, nor dip after leaving the boiler; when it is necessary to raise it, there should be an open pipe inserted at each extremity of the height of the rise; advantage has been taken of this circumstance to avoid doorways. (Fig. 6.)

Fig. 6.



8thly. A certain quantity of motion would be obtained by a single horizontal pipe between any joints except the bottoms of vessels; but the nearer to the surface the more motion will be obtained; and with one pipe there must be a double current in it.

9thly. The retarding effect of friction is directly as the length, and inversely as the diameter of the pipes; it is also increased by every bend angle in the pipes.

It is a fact, not so generally known as it ought to be, that if we communicate a certain quantity of heat to a liquid, it will give out exactly the same quantity again in cooling to its former temperature; less or more it cannot afford. It is equally true, that, with the same temperatures, equal and like surfaces give off equal quantities of heat to air, &c., and consequently, the quantities of heat exchanged under given circumstances are measurable quantities, and this subtile element is brought within the domain of science *.

In general, for hothouses, twice the number of feet contained in the area of the surface of glass will be equal to the number of cubic feet of air which that surface should heat per minute, when in full action.

Now the heat given off by the surfaces of the apparatus depends on the kind of materials they consist of. When bright tinned iron, earthenware, &c., are employed for pipes, much more surface is necessary.

If the cubic feet of air to be heated per minute be multiplied by the number of degrees it is to be warmed, and the result be divided by twice the difference between the temperature of the house and that of the surface of the pipes, the result will be the feet of surface of iron pipe, &c., required.

It is known from experience, that the heat which raises the temperature of one cubic foot of water one degree, will heat 2850 cubic feet of air one degree.

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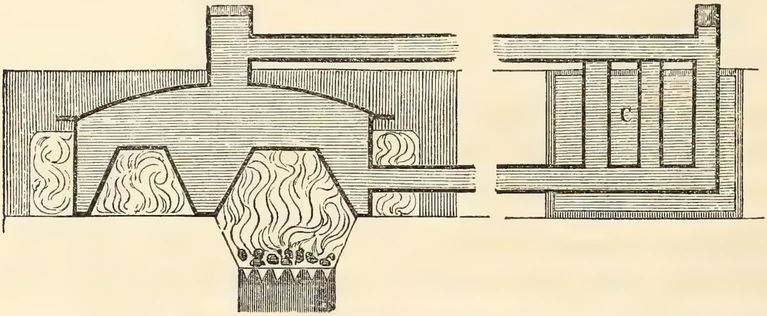
* Sir Isaac Newton first established the laws of heating and cooling, in the Phil. Trans. for 1701.

The most important of the properties of the hot water method consists in the power it has of keeping up the temperature of the house for a long period without attention from the attendants; and it is entirely owing to the excess of fluid that it has this advantage over steam heat.

The ordinary method of making reservoirs and boilers so large as to answer the purpose of maintaining the heat during the night, has the objection of rendering it a considerable time before the apparatus can be raised to a temperature capable of giving much heat; and it appears that it would be a material improvement to heat the water for a reserve of heat, by passing the pipes of the apparatus through the water, so that its temperature should be slowly raised, and the house receive heat during the time.

A small proportion of surface of pipe will heat the water, because water abstracts heat from a heating surface with about twenty times the rapidity that air does at the same temperature: hence, by putting a twentieth part, in addition to the surface required for the house, through a proper reservoir of water, it will be slowly raised to nearly the same temperature as the water in the pipes, and return its heat to the house as soon as the fire ceases to keep up an excess of heat in the pipes. Figure 7 shows such an arrangement, where C is the cistern, with part of the pipe passing through it.

Fig. 7.



There is very little strain on the borders of hot water apparatus, except in cases where there is much difference of level; and, as these rarely occur, consequently they may be constructed in the best mode for applying heat, which is most effectively done by having as much bottom surface as possible, with a boiler of given capacity.

For burning a bushel of coal per hour, the area of the fire-grate should not be less than eight, nor greater than sixteen square feet, and the bottom surface four times the area of the grate, with thirty-two feet of side flue; and a considerable advantage results from adopting the larger proportion for the grate and bottom surface, on account of the fire requiring less attention.

The forms of boilers may be varied in a considerable degree, provided the above quantity of surface receive the effect of the fire; the first kind used by Mr. Atkinson was a parallelopiped, with the fire applied to the base only. I have employed the same form, but of greater length in respect to its width, hence of less capacity, and made the flue to go round the sides of the boiler; it is then of great length and very effective; and this I consider the best and most simple plan for an open-topped boiler, serving as a partial reservoir of heat.

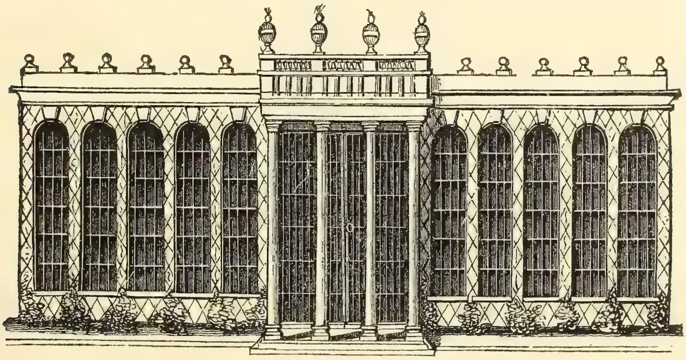
A boiler in the form of half a hollow cylinder, affording a great quantity of fire and flue surface, is made by Messrs. Bailey (fig. 3), and a bottle-shaped boiler is made by Messrs. Cottam and Hallam (fig. 4), which has a considerable quantity of fire and flue surface, compared with its capacity; both these are, therefore, well adapted to cases where only a small reserve of heat is required for night. The variation of the Scotch distillers' boiler (5) is also a good form for maintaining the supply of heat to the house, while a separate reservoir is warmed by one of the pipes.

Another mode of obtaining a large portion of fire and flue surface to a small capacity, is shown in figure 7; but complicated forms have little to recommend them, and are expensive, except when so small as to be cast in iron, because the fire should be partially surrounded by slow conductors of heat, to prevent the dissipation of heat being too rapid, and to render the combustion of the fuel perfect, and, consequently more effectual; hence, a fire-place surrounded on three sides by bricks is better than one in the middle of the boiler.

The best mode of regulating the fire is by means of a door to the ash-pit, having a register, first suggested by Dr. Black, and afterwards put in practice by Count Rumford.

DESCRIPTION OF THE PLANT STOVE AT CHATSWORTH, WITH A SELECT LIST OF THE MOST BEAUTIFUL STOVE CLIMBERS.

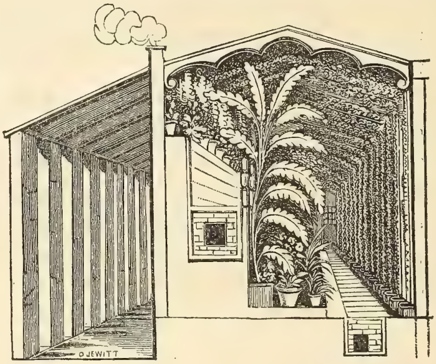
THE house now appropriated to the culture of stove plants at Chatsworth, was originally built for a greenhouse, to which purpose it was devoted, until little more than three years ago, when the interior was remodelled, and a new glass roof was placed on it, making of it an excellent plant stove.



The whole length of the building is one hundred and ten feet, the breadth sixteen feet six inches, inside the walls. The pit on which the large plants are placed is seven feet wide, elevated one foot above the walk.

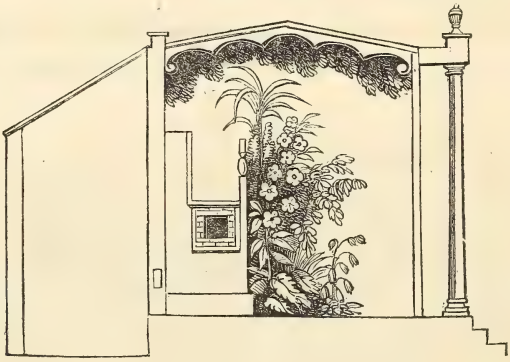
The front walk is paved with stones, and is five feet six inches wide; betwixt each of the front windows is a kind of semi-circular stone basin, extending two feet six inches from the front wall; these basins are filled with rich soil, and are planted with trailing plants, as *Thunbergia alata*, &c. &c., which are trained up trellis to the front wall; they are also occupied by a collection of stove ferns.

The central division of the house is occupied with rockwork, in the front of which is formed a basin for aquatic plants, which basin extends beneath the rockwork to the back wall, where it is supplied by a tap.



There are four furnaces, two of Witly's for the front flues, and two common ones for the flues under the back elevated walk; all the flues pass into the back wall in the centre of the house.

The heat from the front flues is admitted through iron grates laid in the front walk, two feet six inches long, and eight inches broad: a hot air cavity also passes round each of the front basins, and sends heat into the house, by means of a grate opposite each of the front windows.



The back walk *f*, is elevated seven feet from the ground, and is ascended by a flight of eight steps. This walk is two feet six inches wide, and on the side next the wall is an elevated border, one foot wide, chiefly appropriated to succulent plants; the hot air from the flues is admitted betwixt the bars of wood, of which the walk is composed, and has on the side next the plants a neat wooden balustrade. Behind the house are the back sheds.

SELECTION OF STOVE CLIMBERS, WITH THE PERIOD OF FLOWERING.

Coming into Flower in January.

Jasminum Sambac pleno—white.
— trifoliata—white.
Olax scandens—white.
Combretum paniculatum—scarlet.
Thunbergia fragrans—white.

Coming into Flower in February.

Ceropegia elegans—purple.
Combretum grandiflorum—scarlet.
Combretum Afzelia.

Coming into Flower in March.

Solandra grandiflora—white.
— nitida—white.
Columnea hirsuta—red.
Argyreia cuneata—purple.

Coming into Flower in April.

Amphodus ovatus—purple.
Cylista scarrosa—yellow.
Thunbergia alata—buff.
Bignonia gracilis—yellow. Will do best planted in a cool part of the stove.
Boerhaavia scandens—green.
Roxburghia gloriosoides—rose.
Combretum elegans—scarlet.
Bignonia Equinoctialis—yellow.
— — Chamberlaynii—yellow.
— paniculata—purple.

Coming into Flower in May.

Clematis hedysarifolia—white.
Quisqualis Indica—orange-rose.
Celastris nutans—white.
Morenoa grandiflora—scarlet.
— patula—scarlet.
Morenoa globosa—scarlet.
Hoya Pottsii—white.
Combretum comosum—purple.
Passiflora racemosa—scarlet.

Coming into Flower in June.

Mutisia speciosa—rose-coloured. Does best in a cool part of the house.
Petrea volubilis—blue.
Bauhinia racemosa.
— scandens—white.
Combretum purpureum (Poirre coccinea)—scarlet.
Gonolobus diadematus—greenish yellow.
Hoya carnosa—white—honey-flower.
Pergularia odoratissima—green. Very fragrant.
Stigmaphyllon aristatum—yellow.
Thunbergia purpurea—purple.

Coming into Flower in July.

Passiflora Kermesina—crimson.
— Cavanellesii—copper-coloured.
— Buonapartea.
— Quadrangularis—crimson and purple.
— Phœnicea—crimson and purple.
Passiflora princeps—scarlet.
— Andersonii—striped.
Sphœrostema propinqua—yellow.
Clitoria ternatea—blue.
Porana volubilis—white.
Ipomœa—several species.

Coming into Flower in August.

Columnea scandens—scarlet.
Echites stellaris—rose-coloured.
Physianthus albens—white.
Solanum Seaforthiana—blue.
Thunbergia coccinea—scarlet.
Ipomœa—several sorts.

Coming into Flower in September.

Clitoria Plumieri—white and rose-coloured.
Canavalia bonariensis—purple.
Ægiphila elata—white.
Ipomœa—several sorts.

Coming into Flower in October.

Phaseolus caracalla—purple and yellow.
Ipomœa Horsfalliæ—rose coloured.
Thryalli brachystachys—yellow.

Jasminum.—These are plants of easy culture, requiring to be planted in a mixture of rich light loam and peat, and are easily propagated by cuttings of the half ripened wood, either planted in sand or light soil, and plunged in a little heat. They are excellent for pillars and rafters.

Olax.—These require similar culture to the *Jasmines,* and may also be propagated by cuttings.

Combretum.—The whole of this genus is composed of plants of great beauty. They require a strong moist heat, in which they will flower freely. Half ripened cuttings, planted either in sand or light soil, will strike freely if plunged in heat and covered with a glass. They are well suited for either trellis or rafters, and flourish in a mixture of loam and peat. *C. grandiflorum* will grow in a warm greenhouse, and may therefore, when in the stove, be planted in a cool part.

Thunbergia.—All the species require similar treatment to that given for *T. alata.* See page 2 of this Volume.

Ceropegia.—These plants are not so striking for beauty as for their curious appearance; they will grow freely in loam and peat, and may be increased both by cuttings and dividing the root. Suited either for rafters or pillars.

Solandra.—These are not properly climbing plants, they, however, look very well trained against a trellis at the back wall of a stove; and when in flower make a great show. They are easily propagated by cuttings planted in soil and plunged in heat.

Columnea.—The plants of this genus seldom run up very high, but appear most calculated for low trellis, where they will grow and flower vigorously. If they, however, be overwatered, they soon disappear. They strike very freely from cuttings planted in light soil, and placed in a warm situation. The best soil is a mixture of loam and peat.

Argyreia.—All the species of this genus should be planted in good light loam, or a mixture of loam and peat. The *Argyreia cuneata* is a very free flowerer, and requires much less room than the other species of this genus. They are easily propagated by cuttings, planted in light soil and plunged in heat.

Amphodus.—This plant is rather tender, and requires a warm part of the stove, where, up a rafter or a wire, it will run ten or twelve feet. It requires sandy loam, and is increased by cuttings and seeds.

Cylista.—These are of very easy culture, calculated for pillars, should be planted in light soil, and may readily be increased by cuttings.

Bignonia.—All the species of this genus are very handsome when in flower, but they require a deal of room to show themselves to perfection. A little rich light loam suits them well, and the *Gracilis* does best planted in a cool part of the house. They are readily increased by cuttings plunged in heat.

Boerhaavia.—Is very easy of culture, growing freely in a light rich loam, and is propagated by cuttings of the young shoots, and planted when quite tender in light soil, and plunged in a moist heat.

Roxburgia.—Should be planted in sandy loam and peat, and may be increased by division of the roots.

Clematis are either suitable for pillars or trellis, they require a good deal of room, grow freely in light sandy loam, with a small portion of very rotten dung mixed. They are readily increased by cuttings of the half ripened wood, planted in light soil and plunged in heat.

QUISQUALIS.—This requires precisely the same treatment as the *Combretum.* Well suited for rafters or pillars.

CELASTRIS.—Plant in a mixture of rich loam and peat, and propagate by cuttings of ripe wood, planted either in soil or sand, and plunged in heat.

MORENOA.—The species of this genus I am not acquainted with, I believe they are very scarce, but are said to be handsome climbers, well deserving of cultivation. They are propagated by cuttings, planted in sand and covered with glass.

HOYA.—These plants are good ornaments for either pillars or trellis. A mixture of loam and peat suits them well, and the situation somewhat shaded. Propagated freely either by cuttings or seeds.

PASSIFLORA.—See Vol. 1, page 25.

MUTISIA.—A pretty plant of low growth, calculated for a low trellis. It should be planted in peat and mould in a cool part of the stove, where it will flower freely, and may be propagated by cuttings of half ripened wood.

PETREA.—Plant in loam and peat; suited for trellis; and plant cuttings in sand under a bell glass.

GONOLOBUS DIADEMATUS is not remarkable for the showy beauty of its flowers, but has a pretty appearance trained up a pillar or rafter. It should be planted in light soil, and may be propagated by cuttings.

BANHINIA.—Plants with pretty foliage, and calculated for pillars. The flowers are very beautiful. Plant them in a very light loam. They are propagated by half ripened cuttings, planted in sand, and covered with a glass, and plunged in heat.

PERGULARIA ODORATISSIMA.—This plant, when in flower, emits a delightful scent like lemons; and although there is nothing showy in the appearance of the plant, it is well deserving a place in the stove. It thrives in peat and loam, and may be propagated by cuttings.

STIGMAPHYLLON ARISTATUM.—A beautiful plant—may be propagated by cuttings.

SPHŒROSTOMA PROPINQUM.—An entire new hot-house climber—very curious.

CLITORIA.—This genus bears pea-like flowers in abundance. They thrive well in loam and peat, and may be propagated by seeds and cuttings.

PORANA VOLUBILIS will run to a great length on a trellis or rafter. It is increased chiefly by seed, which it produces freely. The soil is peat and loam.

IPOMŒA.—These are beautiful plants for rafters or pillars, being very free flowerers, and easily cultivated. Any light rich soil will suit them, and they are easily propagated by seed, and cuttings.

ECHITES STELLARIS.—We are not acquainted with this plant; but from the figure and description of it given by Dr. Lindley in the Botanical Register of 1664, we are induced to recommend its culture as soon as it is sufficiently increased for distribution by the Horticultural Society. It is said to grow "readily in peat and loam, but is scarcely to be propagated except by cuttings of the root."

PHISIANTHUS ALBENS.—This fine plant we believe is yet very scarce. We have not got it in our possession at Chatsworth, but we understand it climbs beautifully up the rafters of the stove, and flowers freely.

SOLANUM.—This genus is of very simple culture, requiring light soil and propagation by seeds and cuttings.

CANAVALIA.—Plant in sandy loam and propagate by seeds and cuttings.

ÆGIPHILA.—This should be planted against a trellis, in peat and loam, and is easily propagated by cuttings.

PHASEOLUS.—Will grow in any light soil, and is propagated by seeds.

THRYALLIS.—This is an elegant plant, growing upwards of twelve feet high, it is well suited for a rafter. Peat suits it best, and it may be propagated by cuttings.

CULTURE OF NELUMBRIUMS.

The *Nelumbiums* are all aquatic plants of much beauty, all requiring the heat of the stove to grow them to perfection, although in a warm greenhouse they will thrive pretty well.

They may be propagated either by division of the roots or by seeds; the former when the plant is in a torpid state in winter; the latter are sown in April.

In sowing the seeds, open the thickest ends, either by filing or cutting them off with a knife; after which put them in a basin or glass of water, when they will germinate in about a fortnight, if placed in a warm situation.

As soon as they have began to form the first leaf, take them out of the water, and plant them in pots of soil, and plunge the pots over head in water.

They will not thrive in stagnant water; it will therefore be necessary to change it about twice a week, or oftener.

They will scarcely do with much less heat in the day than seventy-five or eighty degrees; of course they do not require so much heat at night.

By the end of the year these seedlings will have become fine plants, when they begin to go into a torpid state; take the pots out of the water, and allow them to become dry, or nearly so, until the season for them to begin to grow again, when they may be replaced in the water as before.

Previous to placing them again in the water in spring, shift them into larger pots (about sixes), or into tubs at once. If it is intended that the tubs should contain the water for them to grow in, they will require to be about eighteen inches deep, and two feet or more square.

To prevent the moss from growing so quickly in the box, it is advisable to lay a portion of sharp river sand on the surface of the soil, for about an inch thick.

Each tub should contain a foot depth of soil (good rich loam); the other six inches should be kept filled with water, except when the plants are in a torpid state.

With proper management they become great ornaments, covering the surface of the water with broad, flat, beautiful leaves, and the *N. speciosa* flowers freely.

NOTE ON THE CULTURE OF SHEERAZ TOBACCO.

BY DR. RIACH OF SHEERAZ.

(*Extracted from the Horticultural Transactions, Vol.* 1, *Part* 3, *New Series.*)

In December, which is about the middle of winter here, the seed is sown in a dark soil, which has been slightly manured. To protect the seed, and keep it warm, the ground is covered with light thorny bushes, which are removed when the plants are three or four inches high; and, during this period, the plants are watered every four or five days, only, however, in the event of sufficient rain to keep the soil well moistened not falling.

The ground must be kept wet until the plants are six or eight inches high, when they are transplanted into a well moistened soil, which has been made into trenches for them; the plants being put on the tops of the ridges, ten or twelve inches apart, while the trenched plots are made so as to retain the water given.

The day they are transplanted, water must be given them, and also every five or six days subsequently, unless rain enough falls to render this unnecessary.

When the plants have become two and a half to three and a quarter feet high, the leaves will be from eight to fifteen inches long. At this period, or when the flowers are forming, ALL the flower-bags are pinched, or twisted off. After this operation, the leaves increase in size and thickness, until the month of August or September, when each plant is cut off close to the root, and again stuck firmly into the ground. At this season of the year, heavy dews fall at night, while exposed to these, the colour of the leaves changes from green to the desired yellow.

When the leaves are sufficiently yellow, the plants are taken from the earth early in the morning, and while they are yet wet with the dew, and heaped on each other in a kupper-house (shed), where they are freely exposed to the wind. While there, and generally in four or five days, those leaves which were still green, become of the desired pale yellow colour. The stalks and centre rib of each leaf are now removed, and thrown away. The leaves are again heaped together in the drying house for three or four days more, when they are in a fit state for packing. For this operation the leaves are carefully spread on each other and formed into a sort of cake, four to five feet in circumference, and three or four inches thick, great care being taken not to break or injure the leaves.

Bags made of strong cloth, but thin, and very open at the sides, are filled with these cakes, which are pressed very strongly down on each other; the leaves would be broken if this were not attended to.

When the bags are filled they are placed separately in the drying-house, and turned daily, until they are to be sent away, when a second bag like the first is sometimes put on.

If the leaves be so dry that there would be a risk of their breaking during the operation of packing, a very slight sprinkling of water is given them to enable them to withstand it without injury. The leaf is valued for being thick, tough, and of a uniform light yellow colour, and of an agreeable aromatic smell.

In the vicinity of Sheeraz, November and December are cool; January and February more so; these may be considered the winter months. In December and January snow falls not unfrequently: the hills are covered with it for some months, but it seldom lies any considerable time in the plains. March and April may be considered the spring (though then the sun, during several hours of the day, is extremely powerful); and the remaining months till November again, as the very hot summer and warm autumn of these parts.

NEW AND BEAUTIFUL PLANTS, FIGURED IN THE THREE LEADING BOTANICAL PERIODICALS.

Of the twenty monthly figures given in these three works, we have only selected such as are new, and well worthy of culture. For descriptions and figures, reference must be made to the works themselves.

THE JUSTICIA TRIBE (ACANTHACEÆ).

Goldfussia (Ruellia) anisophylla (Unequal-leaved Goldfussia).—This beautiful plant was found by Francis de Sylva, at Sylhet, and through Dr. Wallack introduced to European gardens, where it is a great ornament to our stoves, flowering during the winter and spring months. The flowers are handsome, purplish blue, prettily variegated, and veined with pale marks of the same colour, and red and yellow.—*Botanical Magazine*, p. 3404.

THE PEA TRIBE (LEGUMINOSÆ).

Acacia prensans (Prickly feathered Acacia).—A most elegant and lovely shrub. The flowers are scentless, but singular and handsome, from the strong contrast between the bundles of stamens, which are pale yellow, and the interstices, which are of a dark dull mulberry red.—*Botanical Magazine*, p. 3408.

Orobus atropurpureus (Dark purple Orobus).—A native of wild places near Algiers, where it was first noticed by Desfontaines. It is also met with in Sicily, and in the loamy meadows of eastern Calabria, near Cotrone and Cassano. It is a hardy perennial.—*Botanical Register*, 1763.

THE HEATH TRIBE (ERICEÆ).

Rhododendron venustum (Lovely Rosebay).—A dwarf, hardy, evergreen shrub, not exceeding eight inches in height, with flowers of a rich pink, marked inside with dark red spots. This exceeding showy and and interesting plant was raised by Mr. William Smith, in 1829, from seeds of *Rhododendron Caucasicum*, that had been fertilised by *Arboreum*. Mr. Smith has already a good stock of young plants of it.—*British Fl. Gard.* 285.

THE HONEYSUCKLE TRIBE (CAPRIFOLIACEÆ).

Caprifolium hispidulum (Bristly honeysuckle).—A very rare, hardy shrub, with rose-coloured flowers, discovered by Mr. Douglas in the woods of North-West America. It is quite different from all the other honeysuckles, and is nearly scentless.—*Botanical Register,* 1761.

NEW AND BEAUTIFUL ORCHIDEÆ.

TRIBE EPIDENDREÆ.

Bletia reflexa (Reflexed Bletia).—A terrestrial species, a native of Mexico. Its flowers are greenish yellow, mixed with purple.—*Botanical Register,* 1760.

TRIBE VANDEÆ.

Oncidium citrinum (Lemon-coloured Oncidium).—A native of Trinidad, whence it was introduced by Messrs. Loddiges. Unfortunately the plant is since dead, and is therefore for the present lost to the country.—*Botan. Reg.* 1758.

TRIBE MALAXIDEÆ.

Lepanthes tridentata (Three-toothed Lepanthes).—This is one of the most pigmy of *Orchideæ,* not much exceeding in size the moss amongst which it grows. This is the first species of the genus which has been seen alive in Europe. It is a native of Jamaica, where it grows on the bark of trees, among mosses. It can only be preserved alive, with great care, by being kept under a bell-glass, among damp moss, in a cool part of the stove.—*Botanical Register,* 1762.

COLLECTIONS AND RECOLLECTIONS.

EFFECTS OF HEAT AND MOISTURE ON PLANTS.

In the economy of bulbs and tubers, nature teaches a state of repose, and a preservation of vital energies as most conducive to future vigorous development, experienced in the cultivation of the tulip, the hyacinth, and many others. In the whole of vegetation, the important agencies of heat and moisture are well known; the former working chiefly by expanding, the latter floats the nutritious matter into their minutest ramifications. Thus, the end of a creeping rose-shoot, introduced into a hot-house, will grow several inches, while not a bud moves on the plant outside. In its own more fervid climate, the *Yucca gloriosa* displays its honours from the elevation of a stem: while in the open air in this country, the stem remains latent in a bulb. Thus, their conjoined agencies may be traced in the revival of the fading blossoms of a nosegay, by the addition of a little hot water to that already in the glass.—*Rep. of Drummond's Ag. Museum,* 1834.

ANAGALLIS WEBBIANA.

This plant never thrives if it be crowded amongst other plants. It is always better to strike young plants every year: the old ones seldom thrive more than a year. Cuttings taken off at three joints, and planted round the sides of a pot, and plunged in a gentle heat, will strike roots readily.

PLUMIERA RUBRA.

This beautiful stove plant succeeds best in rich light loam, and requires but very little water at any time, but it must be kept very dry when not in a growing state, which will have a tendency to throw it into flower. It is propagated by cuttings, which should be laid to dry for a while, like those of Cacti, and afterwards either struck in tan, or planted in pots.

EFFECT OF IODINE UPON GERMINATION.

A series of comparative experiments have been made by M. Canter upon the germination and vegetation of plants moistened with water, solution of chlorine, and solution of Iodine, the latter of equal density. The following are his conclusions: 1st. Iodine is generally more effectual than chlorine in facilitating the germination of seeds; 2nd. Iodine produces this effect by stimulating the germen of the seeds in the same manner as oxygen and chlorine; 3rd. Iodine is absorbed by the growing plant, but by its affinity for hydrogen, and the power of vegetation, is soon converted into hydriodic acid; 4th. The germination of seeds, which appear to have lost all vital powers, may frequently be excited by iodine.—*Rep. Pat. Invent.*

PLANTING EVERGREENS.

In planting evergreens in winter, a dull, calm day answers very well, but in autumn or spring, a moist rainy day is the best. Whether planting be done in a a dull day, a wet day, or a dry day, it is very necessary to keep in view the expediency of keeping the plants for as short a time out of the ground as possible; if only a few minutes, so much the better: and in all cases when it can be done, where great numbers are to be planted, we should, if possible, have some men stationed to take up the plants, others to carry them, and a third set to put them into the ground. In all seasons, situations, and soils, the plants should be well soaked with water, as soon as the earth is put about the roots.—*M'Nab on planting Evergreens.*

SPONTANEOUS MOVEMENTS OF PLANTS.

In *Megaclinium falcatum*, the labellum, which is connected very slightly with the columna, is almost continually in motion; in a species of *Pterostylis*, there is a kind of convulsive action of the labellum; the filaments of *Oscillatorias* are continually writhing like worms in pain; several other confervas exhibit spontaneous movements; but the most singular case of the kind is that of *Hedysarum gyrans*. This plant has ternate leaves; the terminal leaflet, which is larger than those at the side, does not move, except to sleep; but the lateral ones, especially in warm weather, are in continual motion, both day and night, even when the terminal leaflet is asleep. External stimuli produce no effect; the motions are very irregular the leaflets rise or fall more or less quickly, and retain their position for uncertain periods. Cold water poured upon it stops the motion, but it is immediately newed by warm vapour.—*Lindl. Int. to Bot.*

CEPHALOTUS.

The most striking peculiarity of *Cephalotus* consists in the conversion of a portion of its radical leaves into ascidia or pitchers. But as ascidia in all cases are manifestly formed from or belong to leaves, and as the various parts of the flower in phænogamous plants are now generally regarded as modifications of the same organs, the question is naturally suggested, how far the form and arrangement of the parts of fructification agree in those plants whose leaves are capable of producing ascidia or pitchers. The four principal, and indeed the only, genera in which pitchers occur, are *Nepenthes, Cephalotus, Sarracenia,* and *Dischidia,* and the few other somewhat analogous cases, consisting of the conversion of bracteæ or floral leaves into open cuculli, are found in *Marcgraavia,* and two other genera of the same natural family. The only thing common to all these plants is, that they are *Dicotyledonous.* It may also be remarked, that in those genera in which the ascidia have an operculum (lid), namely, *Nepenthes, Cephalotus,* and *Sarracenia,* they exist in every known species of each genus, and the structure of these genera is so peculiar that they form three distinct natural families; while in *Dischidia* whose pitchers are formed without opercula, these organs are neither found in every species of the genus, nor in any other genus of the extensive natural order to which it belongs.—*Philosophical Journal.*

REVIEW.

Lindley's Ladies' Botany; or a Familiar Introduction to the Study of the Natural System of Botany. By JOHN LINDLEY, Ph. D. F.R.S., &c. Professor of Botany in the University of London. 8vo. cloth boards, plates, 16*s.* plain; 25*s.* highly coloured.

THIS little book has been written in the hope that it may be useful as an elementary introduction to the modern method of studying systematic Botany, and in our judgment, it is admirably adapted to this end. It consists of twenty-five familiar, amusing, and instructive letters, each of which explains two, three, or more, of the natural Orders, forming in the whole fifty-eight.

There are twenty-five neat copper-plate engravings, viz. one for each letter, furnishing the figures of plants which are easily attainable, either from the fields or the commonest gardens, so as to illustrate each order as it proceeds.

The Doctor's style of writing is simple and very interesting, differing widely from any work previously published on this subject, which not only want the pleasant mode of conveying the knowledge, but the far greater part (not excepting Dr. Lindley's famous "Introduction"), notwithstanding their excellence and utility to the practical and experienced, are too complicated for those totally unacquainted with Botany.

The most discouraging parts of Botany to a beginner consist either in the numerous new and strange names, of which the meaning has to be learned, or in the minuteness of the parts by which plants are distinguished from each other, or in the great multitude of species of which the vegetable kingdom consists; and it must be confessed, that there is something seriously alarming in the mass of preliminary knowledge which, it would appear, has to be acquired, before any perceptible progress can be made.

But on looking at the subject a little more closely, we find, that of the technical names employed, only a small number are really necessary in the beginning; that minute parts are little consulted in practice, however much they may be in theory; and that the arrangement of Botanists is so perfect, that no more inconvenience is experienced from the number of species than in any other branch of Natural History.

In the present work the study is divested of many real, and the greater part of the imaginary difficulties usually attending it. The great obstacle to its falling into many hands is its price; and though with all our hearts we wish it every success, we hope a cheaper edition may be devised; not that we consider this dear, for in its present style it could scarcely be afforded cheaper, but because we regret that any persons, and young gardeners in particular, should be deprived of so pleasing and easy a method of studying a science of so much importance to them.

The course to be pursued by those who would push their inquiries beyond the information in this book, should be of this nature. They should read some introduction to Botany, in which the modern views of structure and of vital action are well explained (perhaps not one equals, certainly none excels that written by the Doctor, and reviewed by us, vol. ii. page 129 of the Horticultural Register): they should make themselves familiar with technical terms, which, although avoided in the letters of this work, cannot be dispensed with in works of a more exact and scientific character; they may at the same time perfect themselves in a knowledge of the Natural Orders, by gathering the wild plants that are within their reach, comparing them with each other, and with the characters assigned to them in scientific works.

Having thus provided themselves with a considerable amount of fundamental knowledge, they may apply themselves to the study of the natural system in its great features. They will then, and not till then, be able to appreciate the various modifications of organisation that connect one tribe of plants with another, and to understand the infinite wisdom and beautiful simplicity of design, which are so visible in the vegetable world: the just appreciation of which, through countless gradations of form, structure, and modes of existence, it should be the constant aim of the Botanist to demonstrate.

Notwithstanding all that we have advanced in favour of this work, it still appears necessary to extract a sufficient portion for a specimen of the style. We have borrowed part of Letter VII, on the Chickweed tribe of plants.

" From the earliest period of your familiarity with a garden, you must have been acquainted with those sweet aromatic flowers called *Pinks*, *Piccotees*, and *Carnations*, and you must have admired their beautiful stripes, and the symmetry with which their petals are arranged. It is also not improbable that you have some knowledge of a mean weed, called Chickweed (*Stellaria media*), which inhabits every neglected corner of your garden; Corn Cockle (*Agrostemma Githago*), Bachelors' Buttons (*Lychnis dioica*), Ragged Robin (*Lychnis flos cuculi*), and many species of Catchfly (*Silene*), are also pretty flowers, that you will easily perceive, either by hunting for them in the fields, or by inquiry after them in gardens.

" All these agree with each other in a number of characters which are so remarkable as to divide them from all other plants, and to cause them to be established as a distinct natural order, called the *Chickweed tribe*, which is composed for the chief part of plants of little interest or beauty, among which there is not a single species with unwholesome properties.

" Uninteresting as many of them are, they are so common that every one who pretends to botanical knowledge must learn how to recognise them, even if it were not for the sake of the few kinds, that, like the *pink*, are our familiar acquaintances.

" To understand the structure of the Chickweed tribe, I shall not ask you to take the Chickweed itself, because it is a plant with very small flowers; let us rather seek some species in which all the parts can be easily seen, as a pink, for instance. Here is a pretty species, the glaucous pink (*Dianthus glaucus*) of Scotland; if you have it not in your garden, any other will do as well, provided it is not double.

" This little herb is called glaucous, from a Latin word signifying bluish-grey, because its leaves, like those of many other pinks, have such a colour in a remarkable degree. Its stems are very much swoln at the joints where the leaves are set on. The leaves are exceedingly narrow, undivided, and rather rough at their edge; they have only one single vein, which runs through them from one end to the other.

" How then are we to ascertain whether this plant is exogenous or not? for there is nothing here to show whether the veins have a netted structure; there is apparently only one vein to examine. I must confess this looks very like a difficulty; and I dare say you will now suppose the time has come when you must have recourse to patience and a microscope to learn whether there are two cotyledons in the embryo or only one; believe me, however, we have not yet arrived at so disheartening a point. There are, in fact, many ways of showing you how to determine whether this is an exogenous plant or not, without counting the seed-leaves. That which I select is one of the easiest to understand; but I must first mention a few matters that I have not hitherto touched upon.

" You are no doubt acquainted with some of the idle tales that are told by the ancient poets, of people being changed into trees, or animals, or rocks; one young lady, for example, not only cried her eyes out, but was altogether changed into a running stream; and another was transformed into a spider, because she dared to emulate the goddess of wisdom in tent-stitch: these occurrences they called metamorphoses, a name which Botanists have borrowed for something of a similar nature, which really does happen in plants.

" Hitherto I have always spoken of the different parts of the flower as so many totally distinct organs, and it is certainly true, that the petals, stamens, and pistil, have very different offices to perform. But, at the same time, it seems quite certain that all those, and several other parts, are in a very great degree constructed like leaves; that at a very early period, when they were first formed, they were absolutely the same as leaves of the same age; that it is only after they have been growing for some time that they begin to assume the characters under which they finally appear; and that consequently they are very often found resuming the appearance of common leaves if anything occurs to interfere with their intended structure before it is entirely fixed.

" Thus we find leaves in the place of petals, or as they say, petals metamorphosed into leaves, in some kinds of double tulips; sepals and pistils often changed to leaves in double roses; all the parts of the flower turned into leaves in other plants; and a multitude of similar cases, with which the Botanist is acquainted.

" Now mark the practical application of this knowledge. If the parts of the flower are only leaves in a particular state, any of those parts in which veins can be discovered will serve to show the arrangement of the veins as well as the true leaves themselves. In the *pink* the petals are fully expanded, and full of veins; they are therefore fitting objects to examine, and their structure will tell us whether the *pink* is exogenous or not. You will find them distinctly netted, and thus that question is set at rest.

" This, then, which is an exogenous plant, has opposite undivided leaves seated on the swoln joints of the stem. The calyx consists of a tube composed of five sepals joined together, and separated only near the points. Five petals arise from within them, each of which has a stalk and a blade; the stalks, or claws, as they are called (*ungues*), are very narrow, and stand side by side within the calyx: the blades are much expanded and irregularly lacerated at the end.

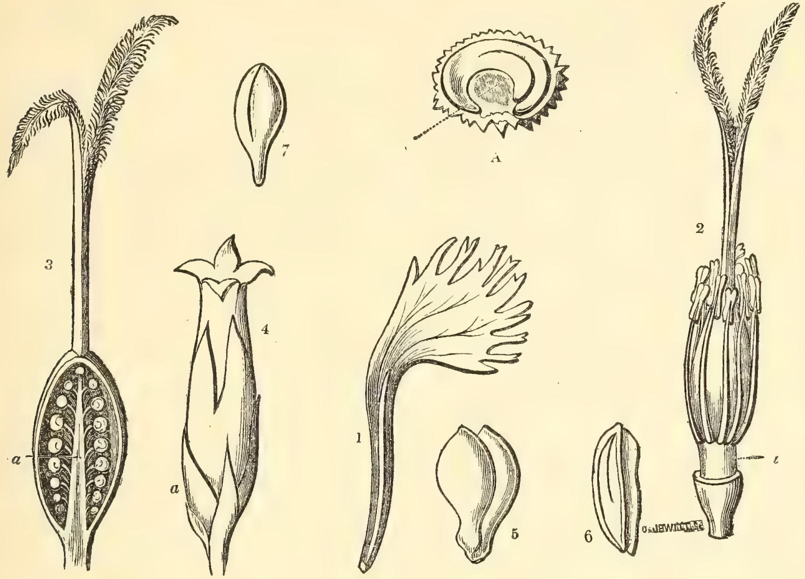
" Stamens there are ten, rising from beneath the ovary, out of a short stalk, fig. 2, *a*. The ovary is superior, and contains but one cell, in the centre of which is a slender receptacle, fig. 3, *a*, covered with many ovules. The styles are two, each terminating insensibly in very narrow fringed stigmas.

" The fruit becomes a dry case, or capsule, opening at the point with four teeth or valves, fig. 4. The structure of the seed is variable, and not important for our present purpose.

" Such is the character of the pink, and such, to a great extent, is that of the tribe it represents. It may be said to consist in these marks:—*Stem swoln at the joints; leaves opposite and undivided; stamens few and hypogynous; ovary with many styles, one cell, and a central receptacle covered with ovules.*

" The genera are very uniform in their structure, and are distinguished by marks that every one may observe. Two divisions are formed, one of which has the sepals united into a tube, the other has them all distinct.

FIG. 4.



" In the first division is found the *pink*, which is known by the bracts at the base of the calyx, fig. 4, *a*, and some others, of which the following are the most remarkable: Silene, or *Catchfly*, has three styles and a little crest at the top of the stalk of each petal; it derives its English name from its often secreting a viscid matter in which flies are caught. The Cockle (*Agrostemma*) has five styles and undivided petals. Lichnis, to which the Ragged Robbin (*L. flos Cuculi*) and Batchelors' Buttons (*L. dioica*) belong, to say nothing of the splendid *Chalcedonian Lychnis* of the gardens, has five styles and divided petals.

" To the second division we refer Chickweed (*Stellaria*), which has three styles and two-lobed petals, Sandwort (*Arenaria*), which has three styles and undivided petals, and Mouse-ear Chickweed (*Cerastum*), which has five styles and a curiously shaped taper seed-case with ten teeth."

OPERATIONS FOR JUNE.

Anemones.—Those planted in February and March will now be coming into flower. They will require shading. See page 18 of the current volume, rules 10, 12.

Azaleas.—All the tender kinds, except those intended to bear seed, should be potted as soon as they have done flowering, which will be some time early in this month. About the middle of the month place them in a somewhat sheltered situation out of doors. Vol. I. p. 126.

ANDROMADE.—The greenhouse and stove species may be placed or plunged in a shady border, early in the month. Vol. I. p. 165.

BANKSIAS.—Should be placed out of doors this month in a sheltered situation, where they will only receive the morning and evening sun; if the weather be not excessively wet. Vol. I. p. 120.

BORONIA SERRULATA.—Cuttings of the half-ripened wood may be put in pots of sand, as recommended last month. Vol. I. p. 173.

CALANDRINIA GRANDIFLORA.—These plants may be turned into the borders early in the month: any common light soil will suit them. Vol. I. p. 222.

CALOCHORTUS VENUSTUS, &c.—These plants, if in pots, must stand in very airy siuations in the greenhouse. They will be coming into flower towards the end of the month.

CHRYSANTHEMUM INDICUM.—Cuttings of this plant, struck in April and May, will require potting off in this month, Vol. I. p. 188.

CLETHRA.—Cuttings of the greenhouse and stove kinds may be put in early in this month.

COMBRETUM.—Cuttings of the various species of this genus should be planted in sand, or light soil, and be plunged in heat, early this month. Vol. I. p. 14.

CYCLAMEN PERSICUM.—The handglass or lights covering the seedling plants may be removed the beginning of this month. Vol. I. p. 180.

CYCLOBOTHRA.—These plants may be treated in the same manner as tulips, for which see Vol. I. pp. 98 and 161.

EPACRIDEÆ.—This is a good time to put in cuttings of these plants; plant them in sand and cover them with a bell-glass, and place in a shady part of the greenhouse. Vol. I. p. 53.

GARDENIA FLORIDA.—Pot off the cuttings put in during the month of April. Vol. I. p. 226.

HOLLIES.—This is the best time of the year to remove hollies. Vol. I. p. 46.

JUSTICIAS.—Propagate by cuttings of the half-ripened wood. Vol. I. p. 102.

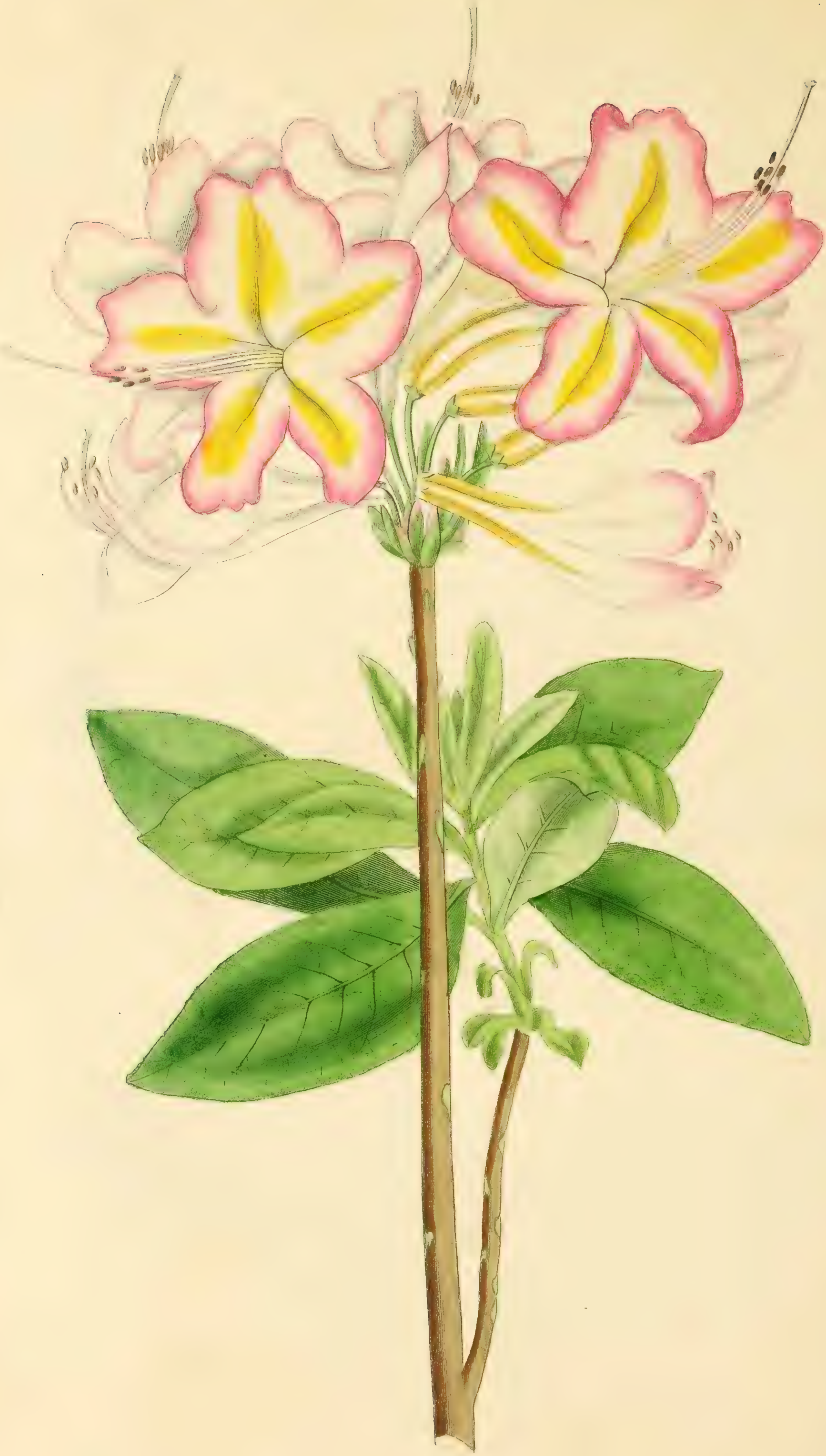
OXALIS CRENATA.—Early in the month turn the roots out of the pots into the open ground. Vol. I. p. 230.

POLIANTHES or Tube Roses now put in will flower late in the autumn. Vol. I. p. 168.

PRIMULA SINENSIS.—Sow the seed in pots or pans filled with light soil, and cover it lightly. Vol. I. p. 182.

POMEGRANATES.—Early in this month is a good time to propagate by layers. Vol. I. p. 64.

PROTEA.—Plant cuttings an inch apart in pots of sand, well drained; place the pots together in the green-house, and cover them with a hand-glass. Vol. I. p. 232.



Azalea marginata.

AZALEA MARGINATA.

(BORDERED FLOWERED AZALEA.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
ERICEÆ.

GENERIC CHARACTER.—Vol. 1, p. 126.
SYNONYM.—*Azalea Sinensis coccinea,* Cunningham's M.S.

THIS beautiful plant is a hybrid produced from *A. coccinea,* fertilised with the pollen of *A. Sinensis.* The size of the flowers and the foliage, with the entire habit of the plant, is quite that of the *A. sinensis,* with the exception of the colour, which differs only in the light orange red round the edge of the corolla, being blended into the yellow in such a manner as to make a beautiful and striking appearance.

Many other plants were raised at the same time with the one figured; and it was curious to observe several of them without the slightest deviation from *A. sinensis.*

For the opportunity of figuring this fine plant, I am indebted to Mr. Cunningham, of Comely Bank, near Edinburgh, in whose collection it flowered last February.

It is an abundant flowerer, and requires the same treatment as the other greenhouse varieties of this genus.

CAMELLIA JAPONICA CUNNINGHAMI.

(MR. CUNNINGHAM'S CAMELLIA.)

CLASS.	ORDER.
MONADELPHIA.	POLYANDRIA.

NATURAL ORDER.
CAMELLIACEÆ.

GENERIC CHARACTER.—See p. 25 of the present volume.

SPECIFIC CHARACTER.—See as above.

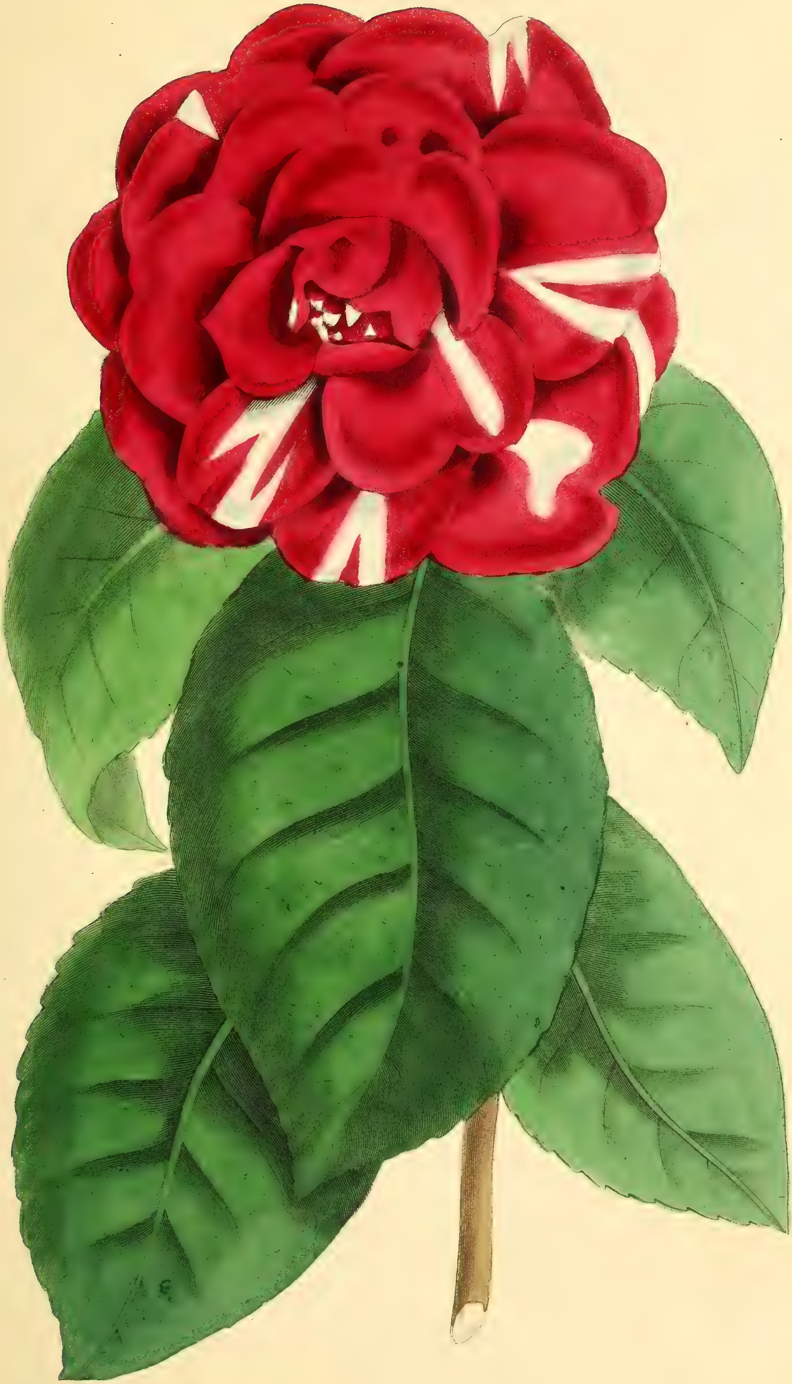
CUNNINGHAMI.—*Flowers* bright crimson, striped with white, varying in almost every flower. *Petals* arranged with great regularity.

SYNONYMS.—*C. mutabilis*, Mr. Cunningham's M.S.

THIS beautiful Camellia was raised by Mr. Cunningham, of Comely Bank nurseries, near Edinburgh, from seed of the Warratah, impregnated with the common striped, and was named by him *mutabilis,* from the various coloured flowers produced on the same plant. Many of the flowers are most elegantly striped with pure white; others possess less of this marking; whilst others are entirely a rich crimson.

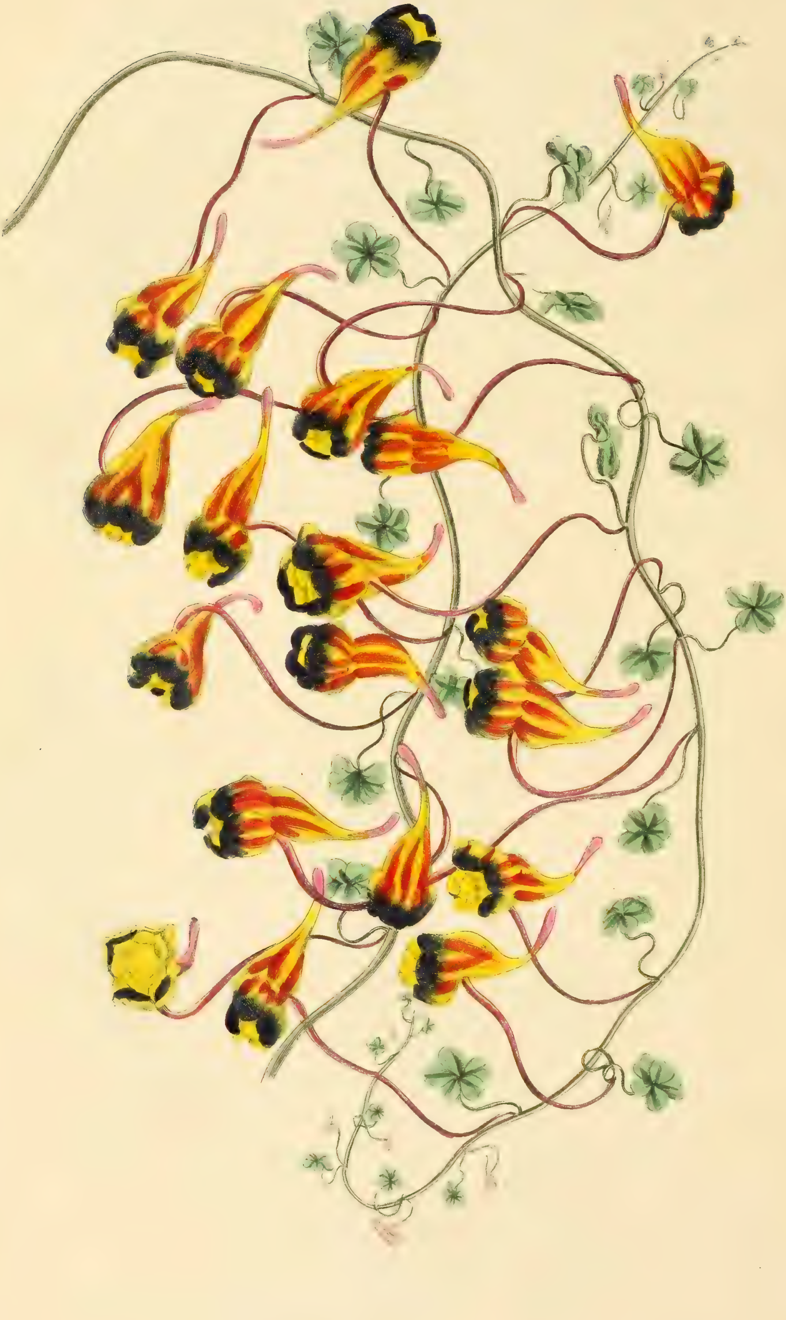
It is a very abundant flowerer, and may be considered a great acquisition to this already extensive and highly ornamental genus of plants. Its foliage is large and handsome, and of a fine dark glossy green.

The culture is the same as for the other species and varieties of camellia. For which, see Vol. 1, p. 33.



F.W. Smith, sc.

Camellia mutabilis.



Tropæolum tricolorum.

TROPÆOLUM TRICOLORUM.

(THREE-COLOURED INDIAN CRESS.)

CLASS.
OCTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
TROPÆOLEÆ.

GENERIC CHARACTER.—*Calyx* five-parted, spurred at the base. *Corolla* five petals. *Germen* smooth three-lobed.

SPECIFIC CHARACTER.—*Root* perennial. *Stem* climbing, slender, much branched, branches usually entangled, of a greenish purple. *Leaves* alternate, six-lobed, pale green, soft and slightly downy. *Leaf-stalk* from half an inch to an inch long, and slender like the branches. *Flower-stalks* from an inch and a half to two inches long. *Calyx* bright orange red, five-cleft, segments blunt. *Petals* five, bright yellow, inserted on the calyx, just below the incisions of the segments, spatulate. *Stamens* eight. *Style* shorter than the stamens. *Germen* three-lobed.

THIS elegant plant is a native of Valparaiso; from whence it was introduced in 1828. The striking distinction and unrivalled brilliancy in the colours of the flowers, render this one of the most desirable climbing plants in this country. It will grow twelve or fourteen feet high, if trained up a trellis, for which it is well adapted; but, from its slender habit of growth, it is scarcely calculated for training to hide any unsightly object. The plant, from which our drawing was taken, was a perfect picture of flowers.

It requires to be planted or potted in peat and loam; and, although it will grow in a warm situation out of doors, yet its delicate growth renders it more properly an inmate of the greenhouse, where it will continue to flower all the summer. It is easily propagated by cuttings, planted in sand under a bell-glass, and plunged in a little heat.

The generic name is derived from the Greek word, *Tropæum,* a warlike trophy; and the specific name from the three colours of the flowers.

For the figure of this fine plant we are indebted to the kindness of Mr. Scirving, Liverpool.

MYANTHUS BARBATUS.

(BEARDED-FLOWERED MYANTHUS.)

CLASS. GYNANDRIA. ORDER. MONANDRIA.

NATURAL ORDER. ORCHIDEÆ.

Generic Character.—*Sepals or calyx leaves*, three in number, spreading, the upper one the narrowest and approaching close to the two upper petals. *Labellum, or lip*, flat, spreading, obovate and three-toothed. *Column* erect, tapering to a slender point at the extremity. *Pollen masses* two in number, and two-lobed behind.

Specific Character.—*Epiphyte* with the habit of *Catasetum cristatum*. *Bulb, or bulb-like stem* striated, oblong, jointed. *Leaves* dark green, glossy, ovate-lanceolate, deeply nerved. *Spike* springing from the root, growing out horizontally, and somewhat drooping at the end, about a foot long. *Perianth* expanded, yellowish green, tinged, and thickly spotted with dark purple, the two lower sepals or calyx-leaves spreading, oblong-lanceolate, the upper ones smaller and narrower, lying close to the two upper petals. *Labellum* joined with the column, spreading, white and shining, numerously spotted with red spots, and much fringed or bearded, whence the specific character.

This beautiful species of Myanthus is one of the last cargo of Orchideæ imported by Mr. Lowe, of Clapton, through his collector, Mr. Henchmann, who found it, we believe, growing upon trees in Trinidad.

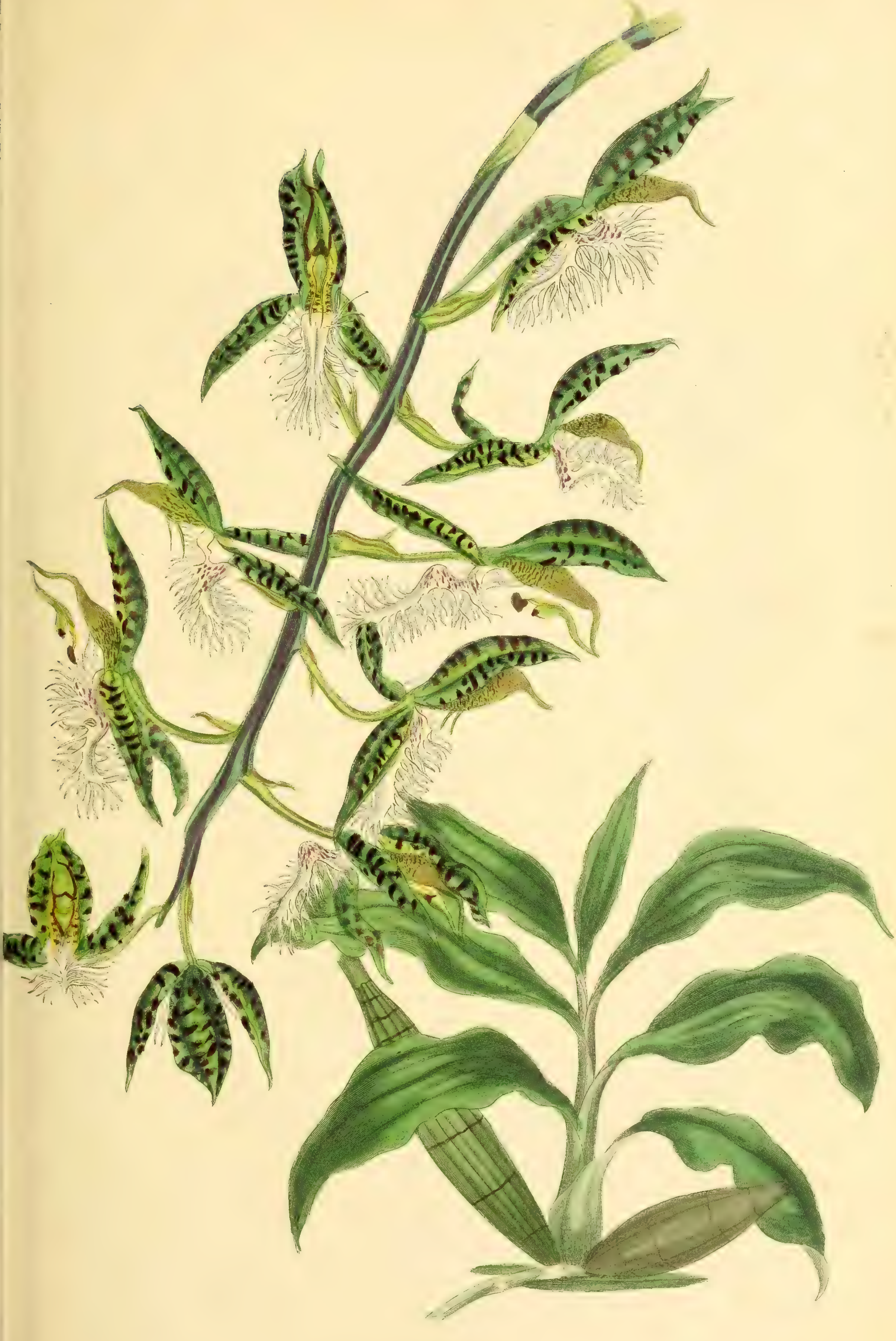
Its flowers opened with us at Chatsworth last April, and emitted a delightful fragrance. The pure white and curious fringe of the labellum, and the dark spotting of the sepals and petals, form so striking a contrast, as to greatly add to the novelty and beauty of the flower.

In habit it greatly resembles the *Catasetums*, particularly the *C. cristatum*. Indeed, the only distinction existing betwixt the Catasetum and Myanthus, is the manner in which the sepals and petals expand, and the peculiar form of the labellum.

Being quite unacquainted with the species, we forwarded the specimen to Dr. Lindley, who was so kind as to inform us that it was named *Myanthus barbatus*, and had lately flowered in several collections.

It is easily cultivated in decayed peat soil, and requires the heat of a stove, like the Catasetums.

The generic name is derived from the Greek word, *Myia*, a fly, because the flowers look, when dried, very much like a fly pressed flat (Lindl.); and the specific name from the bearded appearance of the labellum.



Myanthus barbatus.

mith del.

A FEW HINTS ON THE MANAGEMENT OF ORCHIDEOUS EPIPHYTES, WITH A SELECTION OF THE CHOICEST KINDS AT PRESENT IN CULTIVATION.

This curious and beautiful tribe of plants, has, within the last few years, so interested the plant cultivators of this country, and the peculiarities of their construction and habits are so great, that we presume a few hints on their culture from our own experience and daily observation, may, to the uninitiated, not be without their use.

The collection we possess at Chatsworth, contains upward of three hundred species, amongst which are nearly all the choicest kinds grown in this country. By the treatment our plants receive, they appear to be thriving as well as any other collection we have seen.

Our experience in their culture is not very extensive, having begun to form our collection not more than three years ago; but since that time we have, by watching their progress, and by observations on the system pursued for many years by our valued friend and neighbour, Mr. Cooper, to whom we have been indebted for many useful hints, been tolerably successful.

Our general mode of treatment appears to answer for nearly all the tropical epiphytes; but it is advisable for every cultivator, as much as possible to learn the native habits and situation of each separate species, in order to ensure its successful management.

Some species are found in low dense woods, where scarcely any sun can penetrate; others grow on the trees near to the open breaks in the woods, where they receive a little sun, plenty of light, and a free, but damp air: others again are found growing on single trees, in damp, but exposed situations; and others grow on single trees in elevated situations, where they are subjected to a drier air, and the burning rays of a tropical sun. All these kinds are subjected to a time of drought, and a somewhat low temperature for three or four months in the year; the knowledge of which particulars marks out the line to be pursued in the cultivation of the different species.

The plants of the first kind require shading from the rays of the sun, either by large plants in the house, by creepers, or by some other means, and must have a hot and damp atmosphere.

Those of the second kind, should have a similar atmosphere; but will endure more sunshine than the last. The greatest part of the species come under this head.

Those of the third, must also have a damp atmosphere and plenty of heat; but they thrive best if exposed to the sun, except just at mid-day; for although the sun in the tropics shines with great power, it must be remembered that the plants receive considerable shelter from the branches of the trees (although standing single) on which they grow.

The third class require a lower temperature, less humidity, and nearly a full exposure to the rays of the sun. The plants of all four enjoy light, a free air, and are subjected annually, for three months or more, to a low temperature and great drought; and it is worthy of remark, that the time of drought and the decrease in temperature occur together. This may, therefore, be considered their winter, or time of rest.

Some of the caulescent species grow very freely on wood, as *Renanthera, Vanilla,* &c.; and several others thrive better in moss than soil, as *Aërides, Sarcanthus, Vanda, Saccalobium,* &c.; yet the greater number of species flourish better in pots of soil, provided they are well drained and judiciously treated.

The best kind of soil is a sandy peat, containing as large a portion of fibres as possible (but not spongy). This turfy peat is cut into pieces about an inch square, and about one-third of broken potsherds mixed: this prevents the possibility of stagnation, which, if it took place, would invariably destroy the plants.

In the native habitats of these plants, the season of growth and flowering is that called the *rainy season,* at which time the temperature is high, and the humidity great. But the imitation of such a season in our hot-houses would be very likely to end in loss and disappointment; for although subjected to great humidity (indeed bordering on saturation) in their native country, the situations they occupy in the trees prevents the possibility of injury, except in a few instances, whereas in our artificial climates, the same means used would saturate them, and they would speedily disappear.

To imitate, to a limited extent, the above climate, may be done with benefit; therefore, during the season of growth, never allow the temperature of the house in which the plants are grown, to be less than 75, nor greater than 95 degrees by day, nor lower than 60, or higher than 70 degrees by night.

It is also indispensible that the atmosphere of the house be kept moist in the day time, particularly on sunny warm days; but towards evening allow the moisture to dry up, otherwise when the temperature is decreased, if humidity remains to any great degree, we have found it invariably becomes *injurious,* and to many small plants *fatal;* but in the morning increase the temperature, and when the house is hot, pour water on the floor or other situations, to fill the air with moisture.

Like other plants, *Orchideæ* require a season of rest, or in other words, *a winter.* The best time for this is when there are the fewest outward excitements; this may occupy about four months—from the beginning of November to the end of February.

During this season never allow the heat of the house to exceed 65, or sink lower than 55 degrees, either night or day; and seldom water the plants at their roots, except in a few instances, where they may stand in hot situations in which they might perish from drought; also be careful not to make the air of the house very damp, as during this time they will bear little humidity.

The best season for general potting is the beginning of March, being the close of their season of rest. It is indispensible, previous to potting, that the plants receive no water for a few days; at the March potting they will in general be in good condition for the operation.

In potting, always be careful to give a good drainage; this may be done by filling about one-third of the depth of the pot with broken potsherds. Although the plants are fond of moisture, they never thrive except the water has a free passage through the pot.

Be careful not to place the plant too deep in the pot; it does best if nearly on the surface of the soil. To prevent them falling over, or being easily pulled up, tie their pseudo bulbs or roots to a stick fastened in the soil, and cut off at the top so as scarcely to be seen above the roots fastened to it. So place the pieces of turf that the roots will run freely amongst them, and in a little time the plants will have gotten fast hold of the soil. The species of *Stanhopea* are potted somewhat differently from the other kinds: the pieces of turfy peat are piled six inches above the rim of the pot, and the plant is placed on the top of the pile. To prevent this pile falling down, small pegs are run through each square piece of peat which constitutes the walls, and, when nicely finished, the appearance is very neat.

All the species of *Vanilla, Aërides, Vanda, Saccalobium, Sarcanthus,* together with *Epidendron nocturnum,* and *Dendrobium formosum,* appear to do the best potted in moss, with the pots well drained with potsherds.

Many species will grow freely on a piece of rotten wood set or hung up in the stove, as *Sarcanthus, Vanda, Vanilla;* several species of *Oncidium,* as *O. divaricatum, O. bipfolium, O. crispum,* and many other kinds; in this case they merely require a little moss tying round the bottom of the stem, to facilitate the growth of the roots; but this system is not to be recommended for general practice.

The greater part of *Orchideæ* require but little water to their roots, provided the atmosphere in which they grow is humid. Water carefully round the edges of the pot with a small watering pot, and carefully avoid sprinkling water on the leaves, many species having been found to receive great injury by the practice. It is always requisite that the water used should be of the same temperature as the house in which the plants grow.

The above rule, however, has several exceptions. The *Renanthera coccinea, Vanilla aromatica,* &c. &c. thrive best if they be syringed every morning; but it must be remembered that they will not flourish, if either the water is stagnant at their roots, or their leaves be kept constantly saturated with wet.

The thick bulging stems of many species bear a great resemblance to true bulbs; but being differently constructed, they were named by Dr. Lindley *pseudo-bulbs.* If one of these, having a bud upon it, be separated with a sharp knife, another plant is produced. Others not possessing these bulged parts, or pseudo-bulbs, strike out roots from the joints of the stem, or creep along on the surface of the pot; these may be separated when large enough, and planted in small pots and be treated like the old plants.

The best time for collectors to gather them to import into this country, is in the dry season; they being then in a torpid state, may be packed in boxes with dry moss, and if kept free from moisture during their voyage, there would be a great probability of their arriving safe.

These plants are very liable to be infested by woodlice, which if not quickly eradicated, would soon destroy the plants by eating off the ends of the roots.

The following select list for those who have not large conveniencies, or who wish only to possess the very choicest kinds, will very likely be found useful. It will be seen that we have not included any terrestrial kinds, as the *Disa grandiflora*, *Peristeria elata*, &c.; these must be deferred to a future opportunity, and will be the subject of a few more remarks.

The greater part of the kinds in the following list may be obtained at Messrs. Loddiges, Nurserymen, Hackney; Lowe's, Nurseryman, Clapton; Knight, King's Road, Chelsea, and Rollison, Tooting. Some of the more common kinds may be purchased at from ten to twenty shillings each, others at from two to three pounds, whilst others would cost from five to ten pounds each, and some are scarcely to be met with at any price, except in private collections.

I have added the synonyms to all the plants which have more names than one; this appears to be useful to a purchaser, because it will prevent many mistakes and much useless anxiety; for when a plant has three or four names, an admirer of these kind of plants might expend a large sum to purchase a plant different in name from any which he possessed, and after he has anxiously waited for some time to see it in flower, may prove to be only the same plant he already had under another name.

Aërides odoratum. Aërides cornutum. *Bot. Reg.* 1485.
Aëranthes grandiflora, *Lindl.* Syn. — Dendrobium arachnitis, *Thouars.* Aëranthus arachnitis, *Lindl. in Bot. Reg.* 817. *Gen. and Spec, Orchid.* 243.
——— sesquipedalis. I am not sure whether this species has ever yet been introduced. I have never seen it, but class it with my list from report.
Anguloa superba. Sweet scented species.
Batemannia Colleyi. A new genus.
Brassia lanceana. A fine species.
——— maculata.
——— caudata, *Lindl.* Syn.—Epidendron caudatum, *Linn.* Malaxis caudata, *Willd.*
Brasavola cucullata, *Br.* Syn.—Epid. cucullatum, *Linn.* Cymbidium cucullatum, *Swartz.*
——— nodosa. Syn.—Epidendron nodosum, *Linn.* Cymbidium nodosum, *Swartz.*
Cœlogyne flaccida.
——— punctulata, *Lindl.* Cœlogyne ocellata, *Lindl. Gen. and Spec. Orchid.* 40.
——— nitida, *Lindl.* Syn.—Cymbidium nitidum, *Rox.*
Catasetum luridum. Syn.—Anguloa lurida, *Link, in Prussian Hort. Trans.*
——— tridentatum, *Bot. Mag.* 155. C. Claveringi, *Lodd. Bot. Cab.* 364. And either a variety of, or the same plant in a very vigorous growing state, figured *Bot. Reg.* 840. C. floribundum, *Hook. Exotic Flora*, 151.
——— cristatum, *Lindl.*
Cattleya intermedia, *Graham.*
——— labiata.
——— guttata, *Lindl.*
——— Loddigesii, *Lindl.* Epidendron violaceum, *Lod. Bot. Cab.* 337.

Cattleya Forbesii.
——— crispa.
Cirrhæa Loddigesii, *Lindl.* Syn.—Cymbidium dependens, *Bot. Cab.* 936.
——— fuscolutea, *Lindl.*
——— Warreana, *Lodd. Bot. Cab.* 1999.
——— viridipurpurea, *Lindl.* Syn.—Gongora viridipurpurea, *Hooker, in Bot. Mag.* 2978.
Coryanthes maculata, *Bot. Mag.* 3102.
——— speciosa. Gongora speciosa, *Bot. Mag.* 2755.
Cyrtochilum flavescens.
Cycnoches Loddigesii, *Lodd. Bot. Cab.* 2000. *Bot. Reg.*
Dendrobium speciosum.
——— pulchellum.
——— moschatum, *Wallich.* Syn.—Epidendrum moschatum. Dendrobium calceolus, *Lindl. Gen. and Sp. Orchid.* 83.
——— aggregatum.
——— Pierardi, *Bot. Cab.* 750. Dendrobium cucullatum, *Bot. Reg.* 548.
——— chrysanthum, *Bot. Reg.* 1299.
——— calceolaria, *Hooker's Exotic Flora*, 184.
——— fimbriatum.
——— longicornu.
Epidendrum oncidioides.
——— fragrans. E. lineatum, *Salis.*
——— cuspidatum. E. ciliare, *Bot. Mag.* 463.
——— ciliare. Auliza ciliaris, *Salis.*
——— bicornutum.
——— nocturnum.
——— Harrisonii.
——— odoratissimum. Syn.—Macradenia lutescens, *Bot. Cab.* Encyclia patens, *Bot. Mag.* 3013.
Eria stellata. Syn.—Octomeria stellata, *Spreng.* Dendrobium Javanicum, *Willd.*
Gongora atropurpurea.
Grobya Amhersti. A new genus.
Lælia anceps.
Leptotes bicolor.
Maxillaria tetragona.
——— picta.
——— Harrisoniæ. Syn.—Colax Harrisoniæ, *Lindl.* Dendrobium Harrisoniæ, *Hooker.*
——— Deppei.
——— galeata. Acropera Loddigesii, *Lindl. Gen. and Sp.* 172.
——— Warreana.
——— Barringtoniæ. Syn.—Epidendrum Barringtoniæ, *Sm.* Dendrobium Barringtoniæ, *Hooker.* Maxillaria ciliata, *Lindl.* Dendrobium ciliatum, *Swartz.* Colax Barringtoniæ, *Lindl.*
Monacanthus viridis.
——— discolor.
Myanthus barbatus. A newly introduced species.
——— cernuus. Catasetum trifidum, *Hooker.*
Oncidium flexuosum.
——— bifolium.

Oncidium crispum.
———— altissimum. Epidendrum altissimum, *Jacq.*
———— papilio.
———— bicornutum. O. pubes, *Lindl. Bot. Reg.* 1007.
———— Harrisonianum.
———— pulchellum.
———— ampliatum.
———— Carthaginense. Syn.—Epidendrum undulatum, *Bot. Mag.* 777. Epidendrum Carthaginense, *Jacq.*
———— luridum, *Lindl.* Syn.—O. cuneatum, *Lindl.* Cymbidium guttatum, *Willd.* Epidendron guttatum, *Linn.*
———— triquetrum. Syn.—Cymbidium triquetrum, *Willd.* Epidendrum triquetrum, *Swartz.*
———— divaricatum.
———— Lanceanum.
———— variegatum. Syn.—Epid. variegatum, *Swartz.* Cymbidium variegatum, *Swartz.*
———— marginatum.
Renanthera coccinea.
Rodriguezia secunda. Syn.—Rod. lanceolata, *Bot. Cab.* 676.
———— recurva. Syn.—Gomeza recurva, *Bot. Mag.* 1748.
———— planifolia. Syn.—Gomeza recurva, *Bot. Cab.* 660.
Sarcanthus paniculatus. Syn.—Aërides paniculatum, *Bot. Reg.* 220. Vanda paniculata, *Bot. Reg.* 506.
———— rostratus.
———— teretifolius. Syn.—Vanda teretifolia, *Lindl.*
Sacculobium guttatum. Syn.—Sarcanthus guttatus, *Bot. Reg.* 1443. Epidendrum retusum, *Linn.* Limodorum retusum, *Swartz.* Aërides retusum, *Willd.* Aërides guttatum, *Roxb.*
———— papillosum. Syn.—Cymbidium præmorsum, *Swartz.* Epidendrum præmorsum, *Roxb.* Aërides undulatum, *Smith.* Thalia maravara, *Rhud.*
———— rubrum. S. ampullaceum, *Lindl.*
Stanhopea insignis. Syn.—Epidendrum grandiflorum, *Humboldt and Bonpl.* Anguloa grandiflora, *Spreng.*
———— grandiflora. Syn.—Ceratochilus grandiflorus, *Bot. Cab.* 1414.
———— eburnea.
———— oculata. Syn.—Ceratochilus oculatus, *Bot. Cab.* 1764.
Vanilla planifolia.
Vanda multiflora.
———— Roxburghii.
Zygopetalum rostratum.
———— Mackai. Syn.—Eulophia Mackaiana, *Bot. Reg.* 1433.
———— crinitum.
———— stenochilon.
———— maxillare.

Coming into Flower in February and March.

Brassia Lanceana.
Dendrobium pulchellum.
— aggregatum.
— Pierardi.
— cucullatum.
Eria stellata.
Oncidium ampliatum.
— luridum.
Renanthera coccinea.
Vanilla planifolia.

Coming into Flower in April.

Dendrobium speciosum.
— moschatum.
— chrysanthemum.
— calceolaria.
— fimbriatum.
Epidendrum ciliare.
Leptotes bicolor.
Maxillaria Harrisoniæ.
Myanthus cernuus.
— barbatus.
Oncidium Carthaginense.
Saccalobium guttatum.

Coming into Flower in May.

Cattleya intermedia.
— Forbesii.
Coryanthes maculata.
Epidendrum cuspidatum.
— bicornutum.
Gongora atropurpurea.
Oncidium papilio.
— divaricatum.
— bicornutum.
— crispum.
Rodriguezia recurva.
Stanhopea grandiflora.

Coming into Flower in June.

Aëranthus grandiflora.
— sesquipedalis.
Brassia maculata
— caudata.
Brasavola cucullata.
Cælogyne flaccida.
— punctulata.
— nitida.
Cattleya Loddigesii.
Coryanthus speciosa.
Cyrtochilum flavescens.
Cycnoches Loddigesii.
Dendrobium longicornu.
Epidendrum oncidioides.
— odoratissima.
Maxillaria tetragona.
— Deppei.
— Barringtoniæ.
Oncidium flexuosum.
— crispum.
— marginatum.
— bifolium.
— variegatum.
Sarcanthus paniculatus.
Stanhopea oculata.
Vanda multiflora.

Coming into Flower in July.

Aërides cornutum.
Anguloa superba.
Batemannia Colleyi.
Catasetum tridentatum.
Cirrhæa Warreana.
— viridipurpurea.
Cattleya labiata.
— guttata.
Cirrhæa Loddigesii.
— fusco-lutea.
Oncidium pulchellum.
Zygopetalum Mackai.

Coming into Flower in August.

Cattleya crispa.
Maxillaria galeata.
— Warreana.
Oncidium altissimum.
Oncidium Lanceanum.
Stanhopea eburnea.
Zygopetalum crinitum.
— maxillaris.

Coming into Flower in September.

Brasavola nodosa.
Catasetum luridum.
— purum.
Grobya Amhersti.
Monacanthus viridis.
— discolor.
Oncidium Harrisonianum.
Saccalobium pappillosum.

Coming into Flower in October.

Catasetum cristatum.
Epidendrum fragrans.
— nocturnum.
— Harrisoniæ.
Oncidium triquetrum.
Rodriguezia secunda.
Rodriguezia planifolia.
Sarcanthus rostratus.
— teretifolius.
Stanhopea insignis.
Zygopetalum rostratum.
— stenochilon.

Coming into Flower in November and December.

Lælia anceps.
Maxillaria picta.
Oncidium baccatum.
Vanda Roxburghi.

With regard to the times of flowering stated above, much depends on the state of health in which each plant is, the manner it is, or has been, treated, and other circumstances; also many of the species stated above to flower in a particular month may, if healthy, throw up two or three flower stems at different times in the summer. But the above will show a cultivator who is anxious to have his plants flower, when he may expect to be gratified.

The following short remarks on the different species will be a guide both as to the kind of flowers each bears, and the peculiarities of culture of each species.

Aeranthus grandiflora.—This is a singular plant. It has no bulb. The flowers are solitary, large, and scentless. The colour is pale yellow, with a white lip. It was introduced by the Horticultural Society in 1823, through the late Mr. Forbes, who sent roots from Madagascar, where it grows on trees. It grows well with us in turfy peat, cut in squares half an inch diameter, and mixed with broken pieces of pot, and the bottom of the pot well drained. Another species is known, stated to be far superior to this, called *A. sesquipedalis,* also a native of Madagascar, but which I believe has not yet been introduced. It has been made known to this country by M. du Petit Thouars, and its flowers, said to be white, are very large. A good moist stove is requisite for their growth. The *A. grandiflora* flowers in July.

Aerides cornuta Roxburghi.—Many species of Aërides are known, and not above two or three, I believe, have found their way into our collections. The *A. cornutum* of Roxburgh, or *A. odoratum* of Brown, is a lovely plant, not because of the colour of its flowers, which are far from brilliant, but chiefly on account of its enlivening, delightful fragrance, which is emitted all the time it is in flower. It is stated to have been introduced by Dr. Roxburgh to Kew in 1820; it has since been discovered by Dr. Wallich growing on trees in Eastern India. The flowers are of a light flesh-colour, rather delicate, and are disposed in a loose drooping spike, of from six inches to a foot long, which grows from the axils of the leaves. The flowers continue a long time without fading or losing their fragrance, which in general perfumes the whole house in which they grow. We pot the plants in moss, and place them in a warm part of the stove, where they appear to thrive well; but they increase very slowly. I am not aware how many other species have been introduced to this country; but this is the only one I am acquainted with. It flowers in June.

Anguloa superba.—This is the only species usually found in our collections, and it is well worth every attention that can be paid to it. I believe it is a native of Peru. The scape is short, and contains but few flowers, which are of a reddish colour, variegated and spotted with purple. It does well potted in turfy peat cut in squares half an inch diameter, and well drained. It does not require the hottest part of the stove. It flowers in July.

Batemannia Colleya.—This plant has received its generic name from J.

Bateman, Esq. of Knippersley, who introduced it from Demerara through Mr. Colley, his collector, whence the specific name. The petals and calyx leaves are of a purple red or dull copper-colour inside, and mixed with green outside. The labellum is white, spotted and blotched with red and purple. The flower spike springs from the root, and produces from six to twelve flowers, which open in July. Our plants do well in well drained pots filled with turfy peat cut in squares and mixed with potsherds and rotten wood.

Brassia.—I am only acquainted with three named species, the *B. Lanceana, maculata,* and *caudata.* The first was named after J. H. Lance, Esq., who found it growing upon trees in Demerara, and introduced it to this country. It flowers in March. The flower spike rises from the root, and produces from twelve to eighteen flowers; these are of a rich yellow, spotted with purple, and delightfully fragrant. Our plants thrive in well drained pots filled with turfy peat cut in squares. It is said by Dr. Lindley to grow better in leaf mould, but we have not yet tried the experiment. The *maculata* is also very beautiful; the flowers are pale greenish yellow, spotted with purple. The *caudata* greatly resembles this last, but the sepals and petals are more green, and the two lower sepals have tails from four to six inches long. They will all thrive with the same kind of treatment.

Brasavola cucullata and nodosa.—These two species well deserve a place in every collection, possessing when in flower a very pleasant fragrance; the former flowers usually in June, the latter in September. They are found growing upon trees in the West Indies, where in the evenings, during the seasons of flowering, they fill the surrounding air with their delightful odour. They grow freely with us in a damp stove, in well drained pots filled with turfy peat, cut into squares. Many persons, however, pot them in a mixture of moss and leaf mould, in which, with proper treatment, they thrive very freely.

Cœlogyne.—This genus contains twenty species or more, very few of which have yet found their way into the collections of this country. Amongst the few which have been introduced, three species may be selected for a choice collection, viz. *C. flaccida, nitida,* and *punctulata* (*ocellata,* Lindl.) The first has not been long introduced, and is yet very scarce; yet our good friend and neighbour, Mr. Cooper, flowered it in great perfection at Wentworth in 1833. The flower stem rises from the root and droops over the pot, is eight or ten inches long, and produces from eight to ten flowers. The petals and calyx-leaves are a clear white, and the labellum or lip is the same, but has a blotch of yellow upon it. It was found growing upon trees in Nepal, by Dr. Wallich, and by him sent to this country. The *nitida* and the *punctulata* are said to resemble the *flaccida* in the colour of the flowers, but we have not seen either of them. The *nitida* emits a pleasant fragrance when in flower. They were both discovered by Dr. Wallich growing on trees, the former we believe in Nepal, and the latter in Sylhet. They will thrive in turfy peat cut into squares, as recommended before, and require a good damp stove heat.

Catasetum.—All the plants of this genus are strong and vigorous growing plants. M. Henchmann told us, when at Chatsworth, that they were always found attached either to the stems or strong branches of soft barked trees; and although *Orchideæ* in general flourish in situations where the sun can never penetrate, yet the *Catasets* that were growing in situations fully exposed to the burning rays of the sun were invariably thriving the best. The *C. tridentatum* is a very fine species, and deserves a place in any collection. There is a large variety of this species, which was formerly supposed to be another species, and was accordingly named *Claveringi,* the flowers of which are very fine. The *C. cristatum* is considered by Dr. Lindley as intermediate betwixt *Myanthus* and *Catasetum.* The *C. luridum* also is a very fine species. They all require the same kind of treatment as other *epiphytes* of a similar habit, viz. a hot, damp stove, and to be potted in pieces of turfy peat.

Cattleya.—Of all the species of *Cattleya* yet introduced into this country, none can surpass for beauty and delicacy the *C. crispa.* This splendid kind was introduced in 1826 from Rio. The flower spike rises from the axillæ of the leaves, and produces four or five large spreading splendid flowers. The three calyx leaves or sepals are pure white, as are also the petals, but these last are much curled, hence the specific name. The lip (labellum) is purple in the inside, and white outside, and the margins are much curled. We grow it in a hot damp stove, in well drained pots filled with pieces of turfy peat, but many persons grow it in leaf mould, and it thrives well. The *C. guttata* is likewise a very beautiful kind. The spike produces four or five flowers; the sepals and petals are both a pale yellowish green, spotted with dark red; the labellum is white and purple. It is a native of Brazil, and thrives well with us in a damp stove, planted in pots of turfy peat. The *C. Forbesii* is well worth growing in a first-rate collection, although in point of beauty it is very inferior to any of the others; yet the flowers are handsome, and of a good size, and usually grow in pairs, though occasionally only single flowers are produced upon the flower stems. On a plant now in flower at Chatsworth, some stems have only solitary flowers, others have two upon them. The sepals and petals are yellowish green without any spots, the lip (labellum) is whitish outside, but inside it is yellow and rose colour, and marked with deep red lines. The flowering season is in May. A native of Brazil, where it was discovered by Mr. Forbes. We give it the same treatment as the other *Cattleyas.* The *C. intermedia* is a lovely kind, a figure and description of which we gave in vol. 1, page 151 of this work. The *C. labiata* is a most splendid species, perhaps equal in every point to the *C. crispa.* The flowers are very large and showy; the sepals and petals are a delicate rose-colour, and somewhat curled; the lip on the outside is rose-colour, and the inside is blotched and striped with deep carmine; the edges are tinged with purple and much fringed. It is a native of Brazil, where, according to Messrs. Loddiges, "it was first discovered and sent home by Mr. Swainson." It grows freely at Chatsworth with the same treatment as that recommended for *C. crispa,* although Messrs. Loddiges and others grow it in a mixture of chopped moss, peat soil, and broken crocks. The *C. Loddigesii* is not equal to the last for splendour, but is notwithstanding a very beautiful kind. The flower stem has four or five flowers of a large size; the sepals and petals are a rich rose-colour tinged with blue, and spotted with dark spots; the lip is a lighter colour outside, but within is marked with yellow and purple. We treat it precisely the same as *C. crispa* and the other species. We have another species, the *C. Brooksii,* but we have not yet seen the flower, and are therefore unable to give an opinion from experience.

Cirrhæa.—This genus was first established by Dr. Lindley a few years ago, and there are now four species in our collections, all very beautiful. The *C. Loddigesii* we will first describe. The flower spike is about a foot long, and rises from the root: it is slender, and becomes, when full-grown, quite pendent. From six to ten flowers are produced, of a greenish yellow colour, marked with dark red stripes and spots across the sepals. The labellum is of a very peculiar and extraordinary construction. Its native country is scarcely known. Messrs. Loddiges, who figured it in the *Botanical Cabinet,* t. 936, under the name of *Cymbidium dependens,* thought it was a native of China; but Dr. Lindley thinks it more probable that its native place is Brazil. We grow our plants in the stove in well drained pots filled with turfy peat; but we believe the usual way is to pot them in leaf mould and chopped moss, or leaf mould alone, in either of which they do very well. *C. Warreana* bears a strong resemblance to *C. Loddigesii;* it is a native of Brazil, where it was discovered by Mr. Warre. It requires the same treatment as *Loddigesii. C. viridipurpurea* is a very fine species; the outside of the petals and sepals is a beautiful bright green, the inside is yellow, spotted with dark purple. It requires the same treatment as the other species. *C. fusco-lutea:* this species differs little from the others in appearance, except in the size of the flowers, which in this species are larger. We treat our plants in the same manner as for the other species.

Coryanthes.—The *C. speciosa* was formerly classed amongst the species of *Gongora,* and was figured in the *Botanical Magazine,* t. 2755, as *Gongora speciosa.* The flowers are large and showy, and of a bright yellow colour. The plant is a native of Brazil, where it was discovered by Henry Harrison, Esq. growing upon trees. The blossoms emit a very pleasant fragrance. The flowering season is May. *C. maculata.* This is a very splendid species. The petals and sepals are light buff colour, the inside of the labellum spotted with purple. It is a native of Demerara, where it was found growing on trees. We cultivate both the species in a damp stove, in pots well drained and filled with pieces of turfy peat and broken pots.

Cyrtochilum flavescens.—This plant is rather scarce at present, it being found in but few collections. The flower spike rises from the root, and grows about nine or ten inches high, and produces seven or eight flowers. The sepals and petals are straw-colour, the labellum is the same, spotted with a few longitudinal lines or spots. The column is rose-coloured, and the whole spike of flowers very handsome. It is a native of Mexico, whence it was imported by Mr. Tate. It requires a hot damp stove, and grows freely amongst turfy peat and broken pots.

Cycnoches Loddigesii.—This very extraordinary plant is a native of Surinam, where it is found growing upon trees. The flowers are very large, and delightfully fragrant. The sepals and petals are of a brownish green colour, spotted with darker spots; the labellum is white, spotted with dark red. The flower spike proceeds from the side of the fleshy stem, and produces from six to eight flowers. Sometimes two spikes of flowers are produced at one time, as is the case now with a plant in our possession at Chatsworth. To grow it to perfection it requires to be placed in the hottest part of the Orchideæ-house. The plant in appearance and habit greatly resembles the *catasetums*, and is treated with success in the same way as recommended for them.

Dendrobium.—These are all curious and interesting plants. The *D. speciosum* is common in our stoves, and is very easy of cultivation, requiring merely to be kept in a damp atmosphere, in well drained pots filled with turfy peat, and partially sheltered from the rays of the sun. The flower spike grows from nine to twelve inches high, and produces abundance of pale yellow flowers. *D. pulchellum* is a native of Sylhet, where it grows upon trees. The flowers proceed singly from the joints of the old stem of the plant, particularly towards the end; the sepals are white, tipped with yellowish green; the petals are delicately marked with rose-colour, and the labellum is beautifully fringed, and blotched in the centre with bright orange red. Our plants thrive well in the stove, potted in turfy peat, but it is customary with some collectors to pot it in chopped moss alone, *D. moschatum* is splendid, but as a figure and description of it will appear in our Magazine shortly, we will merely say here that the treatment resembles that of the last. *D. aggregatum* puts up a slender drooping stem from the pseudo-bulb, which contains ten or twelve flowers of an orange-yellow colour. It is a native of India, where it grows upon trees. We give our plants a deal of heat, and as much moisture as the air of the house will afford consistently with the health of the other species. The soil is turfy peat. *D. Pierardi* and *D. cucullatum* have so much resemblance to each other, that we should judge them to either be two varieties of the same species, or one and the same species varying under different treatment or situations. One of our plants has been flowering beautifully, in a well drained pot of turfy peat suspended from the rafter of the house. The sepals and petals are lilac or rose-colour, and the labellum is a light yellow. *D. calceolaria* grows in appearance something like *D. moschata*, but the flowers are similar in colour to those of *D. Pierardi*. It is a beautiful species, and grows freely with us heated the same as the other species of similar habits. *D. chrysanthum*. This species we do not possess, nor have we seen it in flower; but from a figure given by Dr. Lindley, *Botanical Register*, t. 1299, we should say it is elegant. The flowers are a deep yellow, and the inside of the labellum is marked with dark red. *D. fimbriatum*. The flowers of this species bear a great resemblance to those of the last in colour, but in other respects we believe there is a marked difference betwixt them. Our plants thrive in pots of turfy peat, in a moist heat, and sheltered from the rays of the sun. *D. longicornu* is a native of Nepal. The flowers are white and very handsome. It is usually potted in leaf mould and chopped moss. *D. moniliforme* has flowers of a purple and white colour. It is well deserving every attention that can be paid to it..

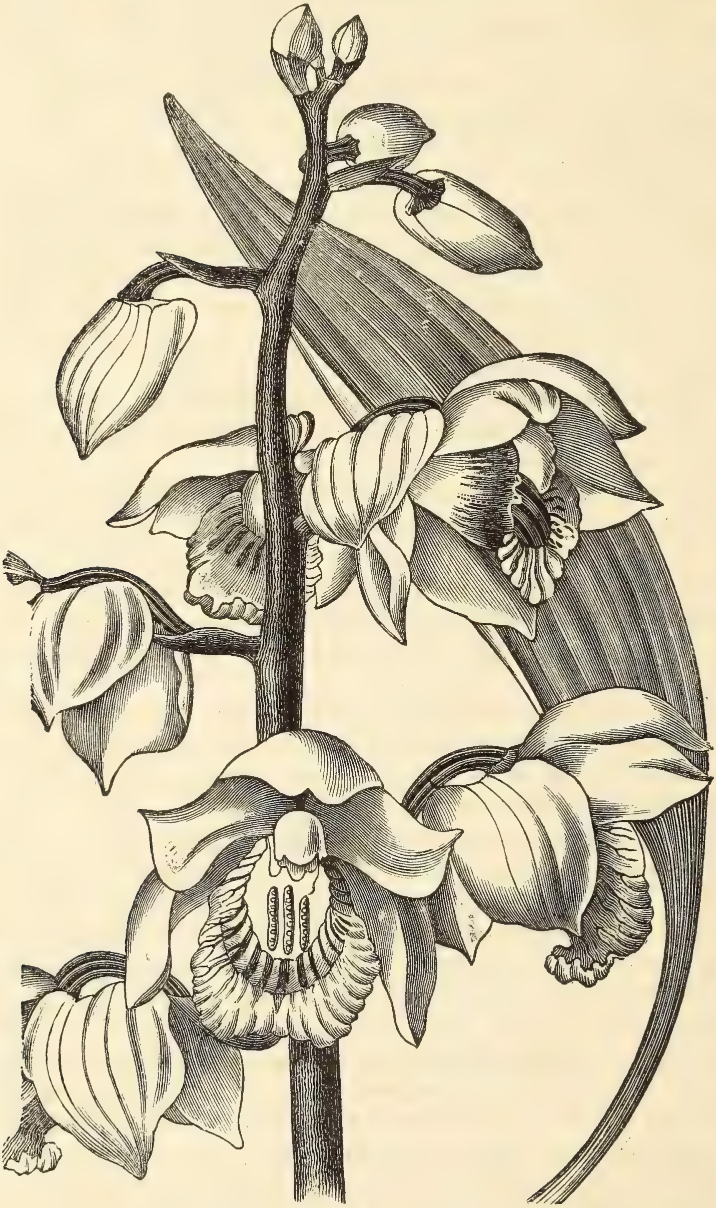
Epidendrum.—The *E. oncidioides* is a beautiful showy kind, throwing up a branching flower stem from two to three feet long, after the manner of *Oncidium* *luridum.* The flowers are yellow tinged with brown, and very fragrant. The leaves are fine, and grow very upright, giving the plant a very noble appearance. We grow our plants in a damp stove in pots filled with turfy peat and potsherds. *E. bicornutum.* This is another delightfully fragrant species, with white flowers. The flower stem grows from nine to twelve inches long, and bears three or four flowers. Our plants grow readily, treated as the last. *E. fragrans.*—This plant, although there is no particular beauty in the flowers, is delightful for its fragrance. The flower stem proceeds from the top of the pseudo-bulb, rises about six inches high, and produces from twelve to fourteen flowers of a pale yellowish green, and the labellum striped with red. It must be kept in the stove, and potted either in turfy peat or vegetable earth. *E. patens* produces a drooping flower stem, containing from four to six pale yellow flowers. It thrives in turfy peat, and should be kept constantly in a damp stove. *E. cuspidatum* and *ciliare* greatly resemble each other. The petals and sepals of each are yellowish green, in the former changing to a pale yellow, in the latter remaining pale green, and the labellum is white and fringed. We pot them in turfy peat, and keep them in a damp stove. *E. nocturnum* yields a powerful odour in the night, but is not remarkable for beauty. Sepals and petals are greenish yellow, and the labellum white. Our plants are grown in pots of moss well drained with potsherds, and kept constantly in the stove. *E. nutans* bears five or six yellow flowers, on a flower stem about six inches high. We grow it in turfy peat. *E. odoratissimum.*—Though the flowers of this plant are far from being handsome, yet its astonishing fragrance renders it exceedingly valuable in any collection. It is easily cultivated in a mixture of turfy peat and wood well drained, and the pots placed in a damp stove. *E. variegatum.*—This plant is a native of Rio, whence it was introduced by Mr. Harrison. The sepals and petals are yellowish green, spotted with dark brown spots, and the labellum pale yellow. Our plants thrive in well drained pots of turfy peat, and placed in a hot damp part of the stove. *E. Harrisoniæ.*—The flowers of this plant are numerous, proceeding from the extremity of a drooping flower stem. The sepals and petals are a delicate green, and the labellum white. Ours grow freely in turfy peat and rotten wood well drained, and placed in a hot part of the stove. *E. pallidiflorum.*—The flowers are small, and grow in a bunch or corymb. The sepals and petals are pale yellow. The treatment is the same as the last.

ERIA STELLATA.—The flower stem of this species grows from eighteen to twenty-four inches high, and produces many greenish yellow star-like flowers, disposed from the bottom to the top. It grows freely with us in pots, turfy peat, well drained, and kept in a damp stove.

GONGORA ATROPURPUREA.—This is a native of Demerara, whence it was introduced by Charles Parker, Esq. The flowers are produced in long pendent racemes, several of which proceed from one plant at the same time. The flowers are dark purple, and of a very peculiar construction. The plant grows well with us potted in turfy peat, and placed in a hot damp stove.

GROBYA AMHERSTI.—This curious species is a native of Brazil, whence it has been very lately introduced. The flower stem springs from the roots, and produces a quantity of curious coloured flowers. Our plant does well potted in turfy peat, and placed in a hot damp stove.

MAXILLARIA TETRAGONA is a native of Brazil, and although the flowers are not so gay as those of many other species, yet they possess a most delightful fragrance. The flower stem arises from the root and produces three or four flowers; the sepals and petals of these flowers are yellow green, and the labellum white.



Our plants thrive well in the stove, potted in turfy peat. *M. picta.*—This elegant species bears solitary flowers, on stems which proceed from the root. The flowers are yellow, beautifully spotted by purple and red. Our plants thrive well in the stove, potted in turfy peat and potsherds. *M. Harrisoniæ* is a strong growing plant; the flower stem is produced at the root, and generally contains two flowers of the most delightful fragrance; the petals and sepals are white, and the labellum purple. The plants thrive well in the stove potted in turfy peat. *M. Deppei.*—Flower stem erect, single-flowered, sepals green, petals white, and labellum yellow. Our plant thrives in turfy peat soil, in a damp stove. *M. galeata* produces nine or ten flowers on a drooping raceme. The flowers are yellowish green. It is now called *Acropera Loddigesii.* The *M. Warreana,* a woodcut of which had been made for the *Hort. Reg.* from the excellent figure given by Messrs. Loddiges. *Bot. Cab.* 1834. The sepals and petals are a delicate white, and the labellum is marked with purple and yellow. We grow it in a pot of turfy peat, well drained, and keep it in a damp hothouse. *M. Barringtoniæ.*—This species requires to be placed in the hottest part of the stove, and will grow potted in turfy peat. The flowers are yellowish green.

Lælia anceps.—This beautiful plant is in the possession of Messrs. Loddiges; we have never yet seen it in flower, but from the figure of it given by Dr. Lindley (*Bot. Reg.* 1751) it appears to be a first-rate kind.

Leptotes bicolor.—The flowers of the species are delicate, sepals and petals are pure white, labellum rose-coloured and column green; the flower stems are short, and generally produce three flowers each. Our plants grow freely in turfy peat, placed in the stove. They will also grow well in moss and broken potsherds.

Monacanthus.—Two species only of this genus have yet been found, the *M. viridis* and *discolor.* They both require precisely the same treatment as the *Catasetums.*

Myanthus.—Only two species of this genus are yet in our collections. The *M. cernuus* bears flowers of a yellowish green, spotted with purple; the spike grows from the root about a foot long, and produces many drooping flowers. *M. barbatus* is quite new to this country. See plate, page 124.

Oncidium.—Many species of the genus are very beautiful, as *O. flexuosum,* a native of Brazil, producing a branching panicle of many flowers of a bright yellow. It is easily cultivated in turfy peat and potsherds, in a damp stove. *O. bifolium* will grow in a pot of turfy peat, well drained, as well as on a stove. See Vol. 1, page 234. *O. crispum.*—The flowers of this species are much curled, and of a reddish copper colour: flower-stem arises from the base, and produces many flowers. *O. altissimum.* This, with a favourable growth, will reach ten feet high; the flower-stem is branching, and contains an abundance of yellow flowers spotted with brown. *O. papilio.*—For singularity of appearance, but few equal, perhaps none exceed this species. It is a native of Trinidad. It produces single flowers on long naked flower-stems, which succeed each other for many months if the stem be preserved; the colour a bright yellow blotched with rich brown. It thrives best with us fastened to a piece of wood, and hung up in a damp stove. *O. bicornutum* is a native of Rio. The panicle of flowers is handsome: the sepals and petals are greenish yellow, blotched and marked with bars of purple brown; and the labellum is spotted with dark red. It is easily cultivated in turfy peat, in a damp stove, where it can be sheltered from the direct rays of the sun. *O. Harrisonianum.*—The flowers of this species are yellow, spotted with a rich brown, are numerous, and borne on a tall slender stem springing from the root. We grow it in the stove potted in turfy peat and potsherds. It also grows freely amongst moss and rotten wood. *O. pulchellum.*—The spike of flowers of this species grows from six to nine inches high; the flowers are pure white, except a little orange about the base of the lip, and a little rose-colour on the column. *O. ampliatum* is a very elegant kind; the large branching raceme of yellow flowers makes a very fine show; the leaves and bulbs greatly resemble those of the *O. papilio.* Our plants thrive well potted in turfy peat, and placed in a hot damp stove. *O. Carthaginense* sends up also a tall spike containing many brownish-green flowers, which though not possessing gaudy colours, have a handsome appearance. We grow it constantly in the stove, potted in turfy peat and potsherds with rotten wood. *O. luridum* greatly resembles the last, but the flowers are somewhat greener; and in several respects the variation is conspicuous when the plants stand side by side. *O. triquetrum.*—This species we do not possess; but our neighbour, Mr. Cooper, flowered it beautifully at Wentworth; and we think it deserves a place in a first-rate collection. *O. divaricatum* is very splendid. We have prepared a drawing, which will appear in due course. It thrives in the stove, either in pots of turfy peat; or fixed on wood, covered with moss. *O. Lanceanum* we possess several plants of, but have not yet seen it in flower: it is stated to be a very splendid species. *O. variegatum,* though not one of the most showy, is yet very beautiful; the raceme is terminal, and contains from eight to ten flowers of a greenish-yellow colour, spotted with dark brown. *O. marginatum* we do not possess, nor have we seen it in flower; but believe it is handsome.

RENANTHERA *coccinea* is a most splendid plant: it grows very freely planted in a pot of moss, and trained either against a wall in a hot part of the stove, or against a piece of wood covered with moss. It will thrive all the better for being syringed every day with water of the same temperature as the house in which it grows. If this be attended to, and the situation be not too shaded, there is a probability of the plant flowering beautifully.

RODRIGUEZIA *secunda* is an elegant kind; the flowers are produced on a spike about eight or nine inches high, are of a rich rose colour, and very beautiful. It is a native of Trinidad, and is easily cultivated in a damp stove, partially shaded from the rays of the sun, and potted in moss. *R. recurva* is not quite so showy as the last, but is a valuable kind; the flowers are yellow. *R. planifolia.* The flowers of this are also yellow, with a tinge of green; the raceme droops very gracefully: it is a very desirable kind. Both this and the last will grow in turfy peat well drained.

SARCANTHUS *paniculatus.* The flower-stem of this species is branching, and grows from a foot and a half to two feet high; the flowers are numerous, bright yellow, marked with brownish-red, and have no scent. It thrives potted in turfy peat, or in moss well drained; but it is grown by many persons in a basket. See Vol. 1, page 15. *S. rostratus* has flowers of an orange colour, marked with red; and is easily cultivated in turfy peat and potsherds, or moss, and must be shaded from the rays of the sun. *S. teretifolius* is a native of China; the sepals and petals are greenish-yellow, marked with red, and the labellum is nearly white; the flower-stem is about six inches, somewhat drooping, and contains ten or twelve flowers. It will grow very well fastened to a piece of wood covered with moss, and hung from the rafter of a damp stove.

SACCOLOBIUM *guttatum* is a beautiful species. The racemes spring from the axils of the leaves, and are from eight to twelve inches long, and contain many flowers: sepals white, spotted with dark red-rose colour; labellum rosy purple. We cultivate our plant in a pot of moss, in a very hot part of a damp stove. *S. papillosum.* The flowers are small, orange-coloured, spotted with red. It is found upon trees in various parts of India, and may be easily cultivated in turfy peat and potsherds, or in a pot of moss, and suspended from the rafter of a damp stove. *S. rubrum.* This species we are not acquainted with, but we understand it is a very fine one, having rose-coloured flowers. Its manner of cultivation we presume is the same as the others.

STANHOPEA *insignis* is a splendid species; a native of Trinidad, whence it was introduced in 1826. The flower-stem proceeds from the roots, grows upwards of six inches long, and produces three or four flowers of a large size, delightfully fragrant, and of splendid appearance, which hang down over the sides of the pot. Both the sepals and petals are pale yellow, spotted with purple red; labellum nearly white, spotted and blotched with dark purple red. *S. grandiflora* is nearly as splendid as the last; the flowers, however, are a delicate white, but very fragrant. It is a native of Trinidad like the last. *S. eburnea.* The flowers are slightly fragrant, and bear some resemblance to the S. grandiflora, but are not so large; the labellum also is spotted and blotched with purple. The plant is a native of Rio Janeiro. *S. oculata.* The flowers of this species are fragrant, and resemble in colour those of the S. insignis, but are not so large. It is a native of Brazil, whence it was introduced a few years ago. From the circumstance of the stem on which the flowers are produced growing from the base of the roots, and having an inclination to descend instead of rising; it not unfrequently happens that the flowers are forced against the inside of the pot beneath the surface of the soil; and if a way be not opened for them to protrude, they are speedily broken. This is remedied by the following system of potting: the pieces of turfy peat in which the plant is potted, should be piled six inches above the rim of the pot, and the plant placed on the top of the pile. To prevent this pile falling down, small pegs are run through each square piece of peat which constitutes the walls; and when nicely finished the appearance is very neat. The flower-stem generally makes its appearance through this pile of soil, above the rim of the pot, and meeting with no obstruction, the flowers expand freely.

VANILLA *planifolia.* This species emits a lovely fragrance at night: it is a climbing plant; and in its native country runs very high in the trees. It will thrive well potted in moss, and trained to a back wall or trellis; and syringed with clear water every morning, or twice a day in fine weather. The flowers are a yellowish white, and are produced in large bunches from the axils of the leaves; each bunch contains twenty flowers or more. It may be easily propagated by cuttings of the stem, taken off at a joint.

VANDA *multiflora.* This is a native of China, from whence it was introduced some years ago. The spike contains many flowers of a pale yellow colour, and is produced on the stem of the plant. It thrives well with us in a damp stove, potted in moss. *V. Roxburghii.*—This is a lovely kind; a native also of China. It grows freely, treated in the same manner as the last.

ZYGOPETALUM ROSTRATUM. This, though not equal to some of the other species, is handsome; the flowers are very large and handsome, but without scent. The petals and sepals are greenish brown, and the labellum white. *Z. Mackai* is a delightful kind. The scape rises from the root, grows to upwards of two feet high, and bears from six to eight handsome flowers; the sepals and petals are yellowish green, blotched, and spotted with brownish red; the labellum is white, spotted with blue and purple. The flowers make their appearance about the end of June, and continue a long time. *Z. crinitum.*—This is considered, both by Dr. Lindley and Dr. Hooker, to be no more than a variety of *Z. Mackai.* The flowers are larger than that species, the spotting on the sepals and petals darker, and the labellum is marked with longitudinal purple stripes and spots. Its habit and manner of growth are like the *Mackai,* and its treatment is the same. *Z. stenochilon* is a native of Brazil. The flowers resemble those of the *Z. Mackai,* but are less. *Z. maxillare.* The labellum of this species is purple; but, in most other respects, it resembles the rest of the genus. It is a native of Rio. All the known species of *Zygopetalum* require one general mode of treatment, viz. to be kept in a hot dry stove and potted in turfy peat, mixed with potsherds, and the pots well drained.

Notwithstanding all that we have said on the subject of the culture of these curious plants, there certainly is very much yet to learn respecting them. Our friend and neighbour, Mr. Cooper, differs from the great majority of cultivators, by giving his plants no more humidity than is customary for the usual culture of stove plants; and yet, perhaps, he has but few equals in success; certainly none grow them to greater perfection than he does.

We have been led into these lengthened remarks, solely from a desire to promote the successful culture of *Orchideæ;* and from what we have seen of the system now recommended, we have no doubt of it answering; but our experience being so limited on this subject, we earnestly request the attention of all successful cultivators in this country; and, if they would kindly favour us, within three months, with a few particulars on their system of management, situation, aspect, or plan of the houses in which they are grown, we shall feel happy to insert them, and use every means in our power to encourage the general culture of so remarkable a class of vegetable creation.

ON CHANGES OF TEMPERATURE IN PLANTS.

In a thesis sustained at the University of Tubingen, Dr. W. Neuffer has presented the results of a number of interesting researches into the changes of temperature which plants undergo. In a thesis presented by M. Halder, in 1826, on the same subject, the author asserted that trees are in winter at a lower temperature than the freezing point, and even pass to the state of congelation without injury to their life. The winter of 1827 and 1828 being very severe, the necessary observations were made at Tubingen for confirming those of M. Halder. The temperature of a poplar was observed during the whole of the year 1828, and the results of this examination differ little from those obtained in the Botanic Garden of Geneva, and published in the first volume of the Bibliothèque Britannique. The temperature of the air and that of the tree were about equal in February; that of the tree was higher in March, April, and May; and again, the temperature of the air was higher during the other months of the year. At the beginning of January the temperature of the tree was higher by ten degrees than that of the external air, which would appear to announce a great disengagement of heat at the time when the aqueous juices of trees congeal. When it thawed, the heat of the tree was four degrees, and even eight degrees, above that of the air. It is to the greater evaporation of trees in summer, that the author attributes the less elevated degree of their temperature. The reason of their heat being greater in spring is, that they then lose very little by evaporation, and retain the mean temperature of the earth, which at that season is a little higher than that of the air. The observations made during two successive winters have shown that the thermometer, in the interior of trees, may descend below zero, without the vegetation suffering. It even descended so low as —5° Fahr., and —1½° Fahr. in some young trees. On the 26th January, 1828, the thermometer indicated + 1½° Fahr.; the day after it suddenly rose to + 34½o Fahr.; the change was not so sudden in the tree, which, the second day, was still below 32° Fahr. Several trees were cut, and they were found frozen in concentric circles to a certain depth. The frozen wood was easily known by the greater resistance which it offered to cutting instruments. In the six trees that were cut, the wood was frozen to the following mean depths:—*Æsculus Hippocastanum,* 8.2 lines; *Fraxinus excelsior,* 12.5 lines; *Acer Pseudoplatanus,* 15.2 lines; *Fraxinus excelsior,* 16.8 lines; *Corylus Avellana,* 16.9 lines; *Salix fragilis,* 17.3 lines. The water in a pool near these trees was frozen to the depth of 8.8 inches.

Experiments, made with care, prove that the cold had penetrated into the trees, partly in direct proportion to the quantity of water which their wood contained. But much more certain results were obtained by the examination of the concentric layers of different trees, and the result was, that the cold had penetrated least into the trees whose layers were closest.

In spring the cold often causes trees to perish, without their having been injured by it in winter. On this subject the author apprises us that nearly all trees contain at the beginning of April eight per cent. more of aqueous parts than at the end of

January. Water being a better conductor of heat than dry wood, the deleterious action of cold upon trees will easily be accounted for by its great abundance. The young branches containing a much greater quantity of water, suffer more from cold.

OPERATIONS FOR JULY.

Anemones now planted will flower in October. Vol. II. p. 16.

Bouvardias.—Cuttings put in during May and June will require potting off.—Vol. I. p. 226.

Banksias.—Cuttings should be put in this month, selecting wood as recommended. Vol. I. p. 120.

Calochortus.—The different species will now be in flower; be careful, after the leaves begin to die, not to over water them. Vol. I. p. 175.

Cacti.—If not turned out of doors last month, do it early in this. Vol. I. p. 50.

Calceolarias.—Cut down the flowering stems of some, and top dress them, to induce them to flower late in the autumn. Vol. I. p. 248.

Calandrinia.—The different species turned last month into the open borders will now be coming into flower. Vol. I. p. 222.

Hearts-ease.—Collect the seeds as they ripen, and sow them immediately. Vol. I. p. 116.

Camellias.—In the beginning of the month place them in a rather shady place out of doors. Vol. I. p. 33.

Chrysanthemums.—About the end of this month, or the beginning of August, the young plants for flowering next November will require potting. This is also the season for layering any choice kind. Vol. I. p. 188.

Epacris.—If the different species were not turned out of doors last month, the sooner it is done this month the better. Vol. I. p. 53.

Erica.—Cuttings of many sorts are in a proper condition this month. Vol. I. p. 336.

Gardenia Florida.—The cuttings put in about the beginning of April, and potted off in May, will require to be repotted early in this month. Vol. I. p. 227.

Hollies.—This is the season for planting hollies, but it is best not to extend beyond the early part of the month.—Vol. I. p. 46.

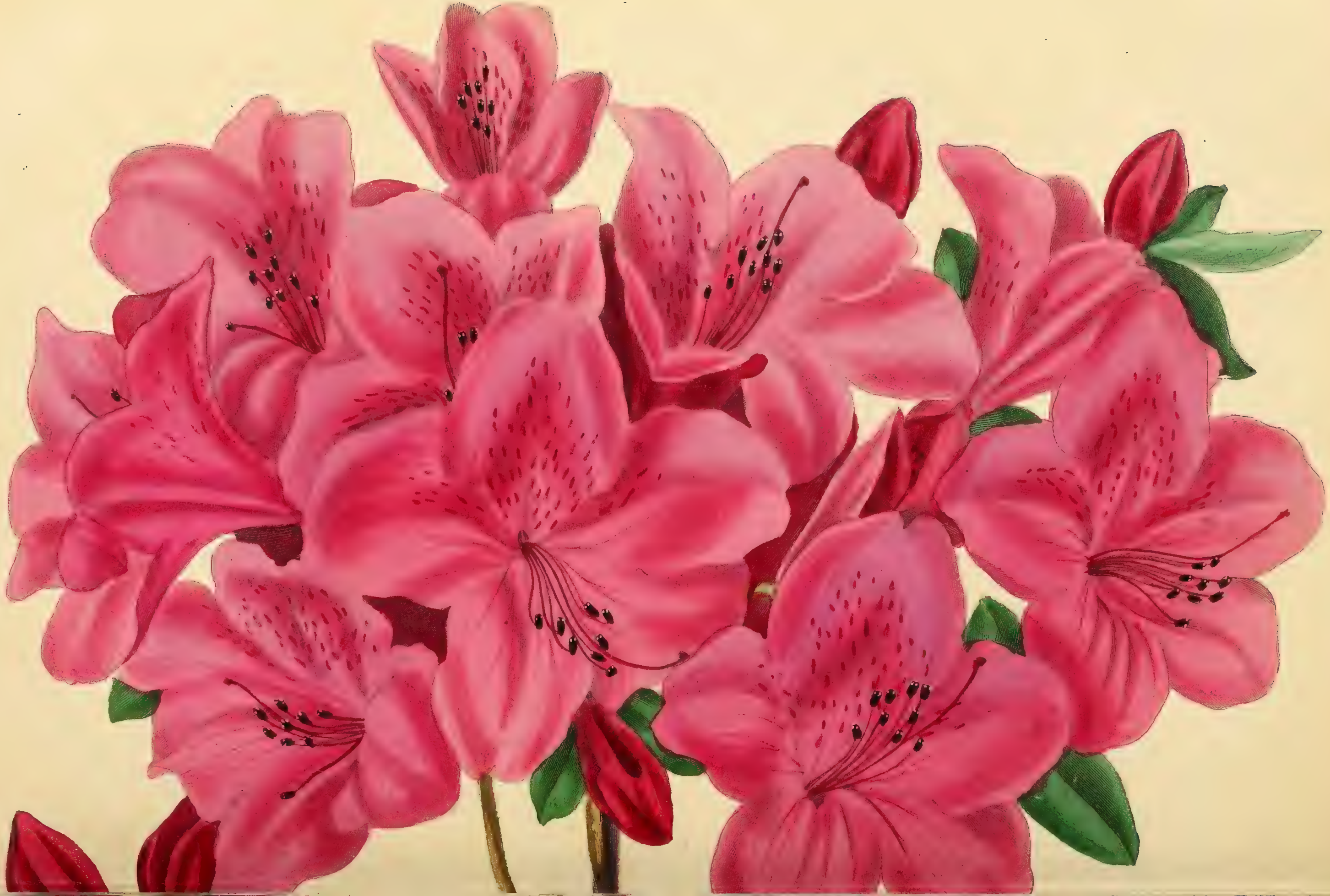
Mule Pink.—Put in cuttings the first week.—Vol. I. p. 67.

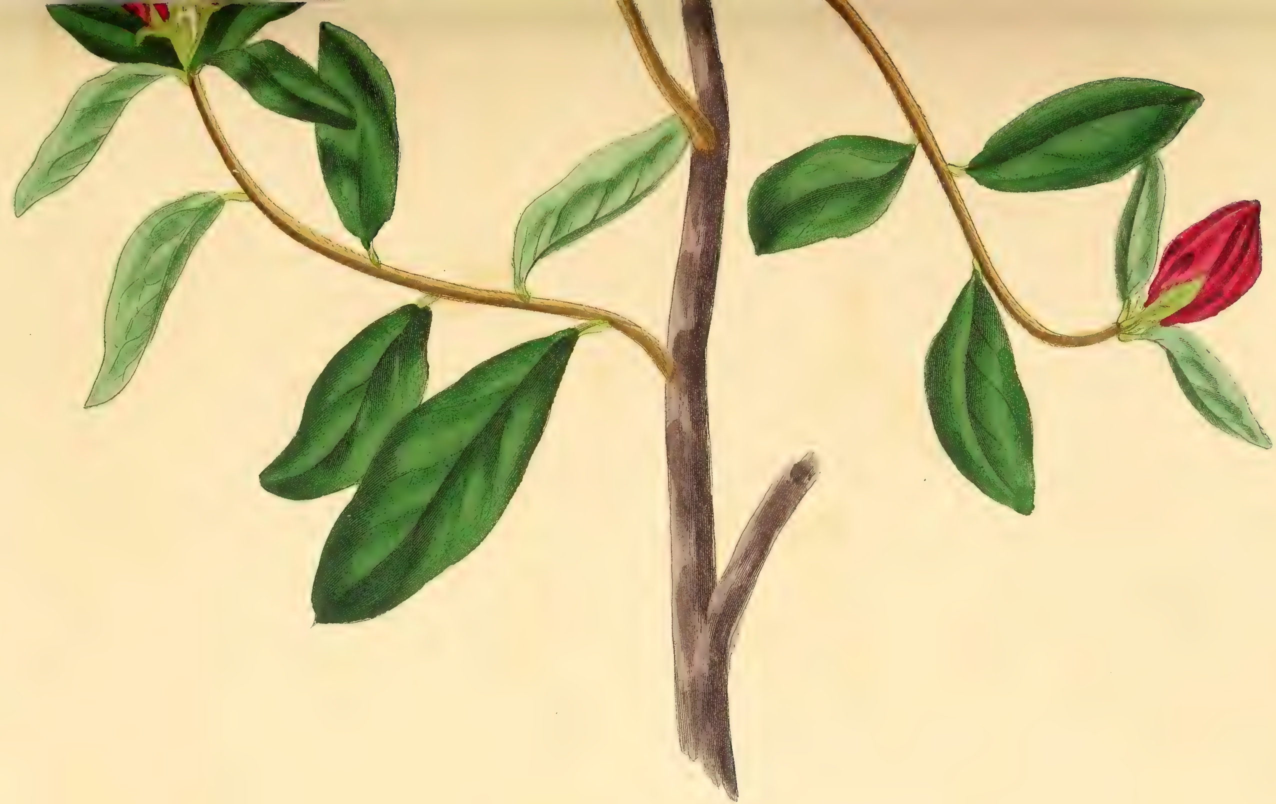
Pinks.—This is the season for putting in pipings. Vol. I. p. 74.

Mignonette sown the last week will come into flower in November and December. Vol. II. p. 6.

Protea.—Put in cuttings early in the month. Vol. I. p. 231.

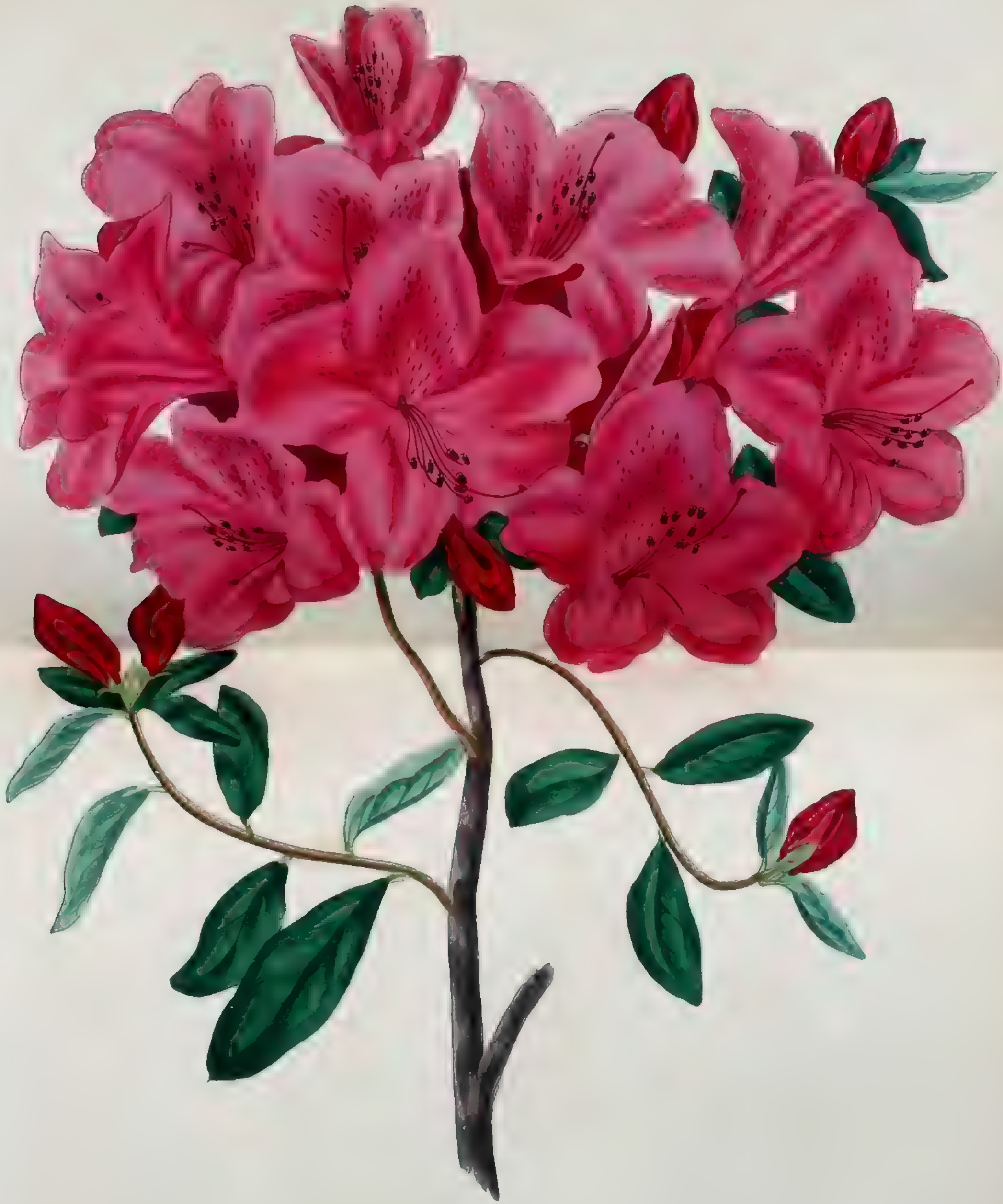
Violets.—About the end of the month, plant strong runners or plants previously prepared in another bed, into the situations where they are to flower in winter. Vol. I. p. 116.





Azalea indica Smithii.

F. W. Smith, del et sc.



Azalea indica Smithii

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AZALEA INDICA SMITHII.

(MR. SMITH'S INDIAN AZALEA.)

CLASS.
PENT-DECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
RHODORACEÆ.

GENERIC CHARACTER.—Vol. 1, p. 126.

SPECIFIC CHARACTER.—A shrub growing from four to six feet high, evergreen. *Stems* numerous, branching, thickly covered with brown hairs. *Leaves* betwixt elliptical and lanceolate, upper surface shining green, under surface somewhat lighter, covered with brown hairs, both on the upper and under surface. *Flowers* usually single, but sometimes in pairs, terminal. *Corolla* scarlet.

VARIETY SMITHII.—Flowers of a rich dark rose colour, large, measuring upwards of three inches in diameter, spotted with darker spots; collected in a fine head at the termination of the branches. In other respects resembling the *A. indica.*

SYNONYM.—*Rhododendron Indicum Smithii*, Brit. Fl. Gard. N. S. 154.

THIS very splendid variety of *Azalea* was raised by Mr. Smith, late of Coombe Wood, from seeds of *Azalea phœnicea,* that had been fertilised with *A. Indicum.* In many respects this plant possesses the characters of both the kinds, but it varies from them both by its flowers often forming fine bunches, similar to those of *Rhododendron.* Our figure represents a bunch of this kind; but this is not a standing characteristic. Sometimes only two or three flowers terminate each of the branches. It is, however, a very free flowerer, and is easy of culture, requiring the shelter of a greenhouse, and the same kind of treatment as detailed, Vol. 1, p. 126.

For our figure we are indebted to the kindness of Messrs. Lees, Nurserymen, Hammersmith, where fine young plants may be obtained at a moderate price.

BLETIA SHEPHERDII.

(MR. SHEPHERD'S BLETIA.)

CLASS.	ORDER.
GYNANDRIA.	MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

GENERIC CHARACTER.—*Lip or Labellum* sessile, cucullate. *Sepals* five, distinct. *Column* separate. *Pollen Masses* eight, or four and two lobed.

SPECIFIC CHARACTER.—Terrestrial Orchidea. *Leaves* a foot or more long, plaited, lanceolate. *Flower Stem* about two feet six inches high, branching. *Sepals* dark purple. *Column* much paler. *Labellum or Lip* marked down the centre with longitudinal yellow plaits. Habit of growth that of the *B. verecunda.*

SYNONYM.—*Limodorum tuberosum*, Messrs. Shepherds, Liverpool.

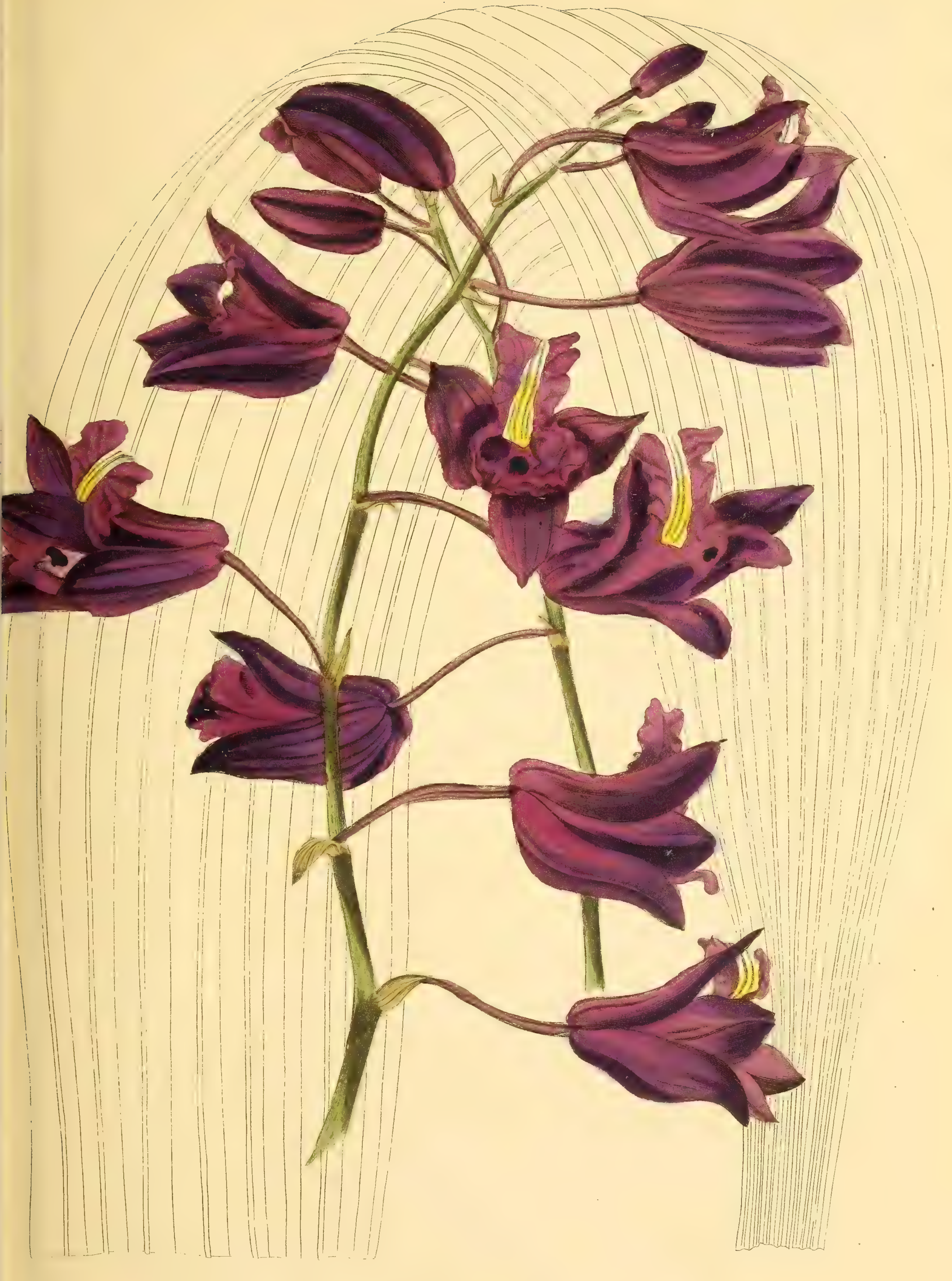
THIS orchideous plant is a native of Jamaica, from whence it was introduced some years ago (probably about 1825, or 1826), to Messrs. Shepherds', of Liverpool; after whom it has been named by Dr. Hooker, *Bot. Mag.*, 3319.

The flower is beautiful, and the plant should be cultivated in every collection of orchideous plants in the country. It flowered freely with us last February and March.

It requires the constant heat of the stove, and should be potted in light loam and peat, and is easily propagated by division of the roots.

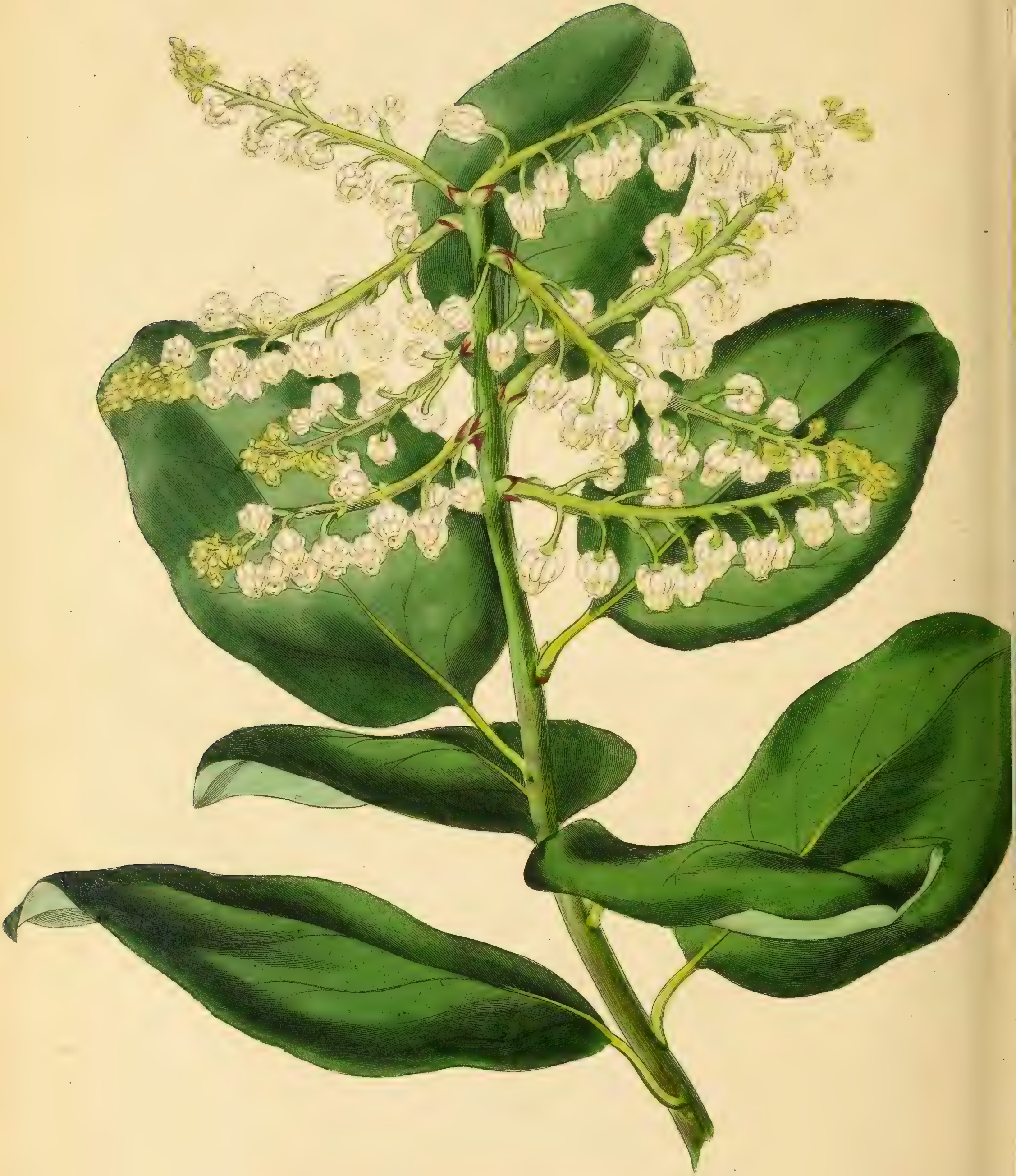
For our figure we are indebted to the kindness of our friend, Mr. Cooper, of Wentworth.

Plants of this species may be obtained at any of the following:—Messrs. Loddiges, Hackney; Mr. Knight, King's-road, Chelsea; Messrs. Young's, of Epsom; and, indeed, at most nurseries where collections of orchideæ are kept.



Bletia Shepherdii.

F.W. Smith sc.



Arbutus procera

ARBUTUS PROCERA.

(LOFTY STRAWBERRY TREE.)

CLASS.	ORDER.
DECANDRIA.	MONOGYNIA.

NATURAL ORDER.

ERICEÆ.

Generic Character.—*Calyx* five cleft. *Corolla* ovate, five parted. *Filaments* half the length of the corolla. *Berry* five celled, strawberry-like.

Specific Character.—An evergreen shrub. *Leaves* broad, ovate, acuminate, sometimes nearly plain on the edges, at other times deeply serrated, bright green and very glossy. *Flowers* terminal, disposed in a spreading panicle. *Corolla* white, ovate. *Fruit* resembling that of the Arbutus Unedo, or common.

This shrub was discovered, on the coast of North America, by the late Mr. Douglas, who sent it, amongst many other things, to the Horticultural Society of London, in 1825, in whose service he was sent out as collector.

It is rather tender, and if grown in the open air it should be planted in a warm situation, where, however, it will be sheltered from the mid-day sun.

It forms a very handsome bush, and planted in peat soil grows very freely. It may be increased either by seeds, layers, or cuttings.

MODE OF LABELLING PLANTS.

BY MR. R. BALL.

(*Extracted from the Irish Farmer's and Gardener's Magazine.*)

A VERY superior label for plants may be made by turning to account that hitherto time-wasting accomplishment called "transferring." The mode proposed is, to lay on the upper portion of a suitable slip of glass, a coat of transfer varnish, on which the name, &c., of a plant printed on paper and moistened is to be pressed with the finger (the printed side downwards). When the varnish is dry the paper is to be rubbed off gently with a damp cloth, leaving the printing attached to the glass, on which a strong coat of white oil paint is to be laid, and sprinkled with fine sand or powdered glass; or another slip of glass similar to the first, painted on one side with white lead, may be cemented on it, when a label of surpassing distinctness and permanency will be produced. Any ordinary printed catalogue of plants may be made available for the purpose above stated.

A FEW HINTS ON THE MANAGEMENT OF TERRESTRIAL ORCHIDEÆ, WITH A SELECTION OF THE CHOICEST KINDS AT PRESENT IN CULTIVATION.

THE terrestrial species of Orchideæ are by no means so numerous as the Epiphytes, and as they are not found in the same situations as the other, they are consequently subjected to different treatment, and have different habits.

They are called terrestrial because they are invariably found in their natural habitats, either growing upon the ground, or in situations where they directly derive nourishment from the soil, which the epiphytes do not.

This division of Orchideæ may be separated, with regard to treatment, into four divisions. 1st. *Those requiring the Stove,* as all the kinds introduced from tropical countries. 2nd. *Greenhouse kinds,* as the species from the Cape of Good Hope, and other places with about the same temperature. 3rd. *Frame kinds,* being such as grow in the south of Europe, some parts of America, and other places of like temperature: and *Hardy kinds,* as many sorts from North America, the Old Continent, and such as are indigenous to this country.

All the *stove* species in the appended list, require similar treatment to each other, with the exception of a few which should have rather a stronger heat than the others, as *Acanthophippium bicolor, Eulophia Guineensis, Peristeria elata, Phajus maculatus,* &c., which the remarks on the separate species in this paper will show.

The best sort of soil is very sandy peat and leaf mould; the former well broken to pieces, and the latter sifted, and the two well mixed together.

All these terrestrial kinds require a season of rest, or a winter, like the epiphytes: the best season for this is from November to the end of March. But to this rule there are a few exceptions: the tops of some of the herbaceous kinds will die down at one time, and others at other times of the year; and whenever that occurs, let such plants be placed in cooler situations, and receive little or no water until they begin again to grow. This period of rest will be their winter.

The general season for potting is the beginning of April; but potting must be done at all seasons when the plants require it.

In potting, always drain the pots well with broken potsherds, to carefully prevent any stagnation, which is generally fatal to all the tender kinds.

Water regularly as often as the plants require it, except during the time of wintering, when they should be kept dry, or nearly so.

The temperature of the stove species should not exceed 95 degrees, nor be lower than 75 degrees by day; or more than 70 degrees, or lower than 60 degrees by night during the time of their growth: but in the season of wintering never allow the heat to exceed 65 degrees, or be lower than 55 degrees either night or day.

The *Greenhouse* kinds are very simple in their culture, merely requiring the same treatment as the stove kinds, except in the heat.

The *Frame* kinds will, for the most part, grow freely planted out of doors, during the summer season, in the same way as the hardy kinds; but they require sheltering in winter from the frost and wet. A system recommended by Mr. Stewart Murray, of the Glasgow Botanic Garden, and inserted in the London Horticultural Transactions, Vol. VI. answers well He "places a glass frame 9½ feet wide, 2½ feet high at the back, 15 inches high in front, and of any length necessary, on a well-sheltered border, facing the south. The original soil within the frame is dug out to the depth of 16 inches, and the vacuum filled up with a mixture of one third leaf mould, one third turfy peat, one sixth spagnum or bog moss, and one sixth sand; the whole is well broke and mixed together, but not sifted. The roots are then planted in this; and care is taken that those kinds which require little moisture, are raised something above the level of the others. When planted water regularly, and shade when the sun is very hot; and admit air to prevent the plants drawing. After they have done flowering, and the stems have died down, cut off the dead parts, and top-dress them with the compost as above."

The *hardy* kinds will grow freely in the open air, in a well drained, warm situation. Early in the spring, when they are beginning to grow, shelter them a a little from the cutting winds which prevail at that season. The best situation for the border, is an eastern or north-eastern aspect: a southern aspect is too hot, unless the plants are partially shaded. It is also an advantage, if the border devoted to them be covered with moss, should the weather prove very dry.

The soil most suitable for them is light maiden loam and peat earth, well mixed, and made open with sand.

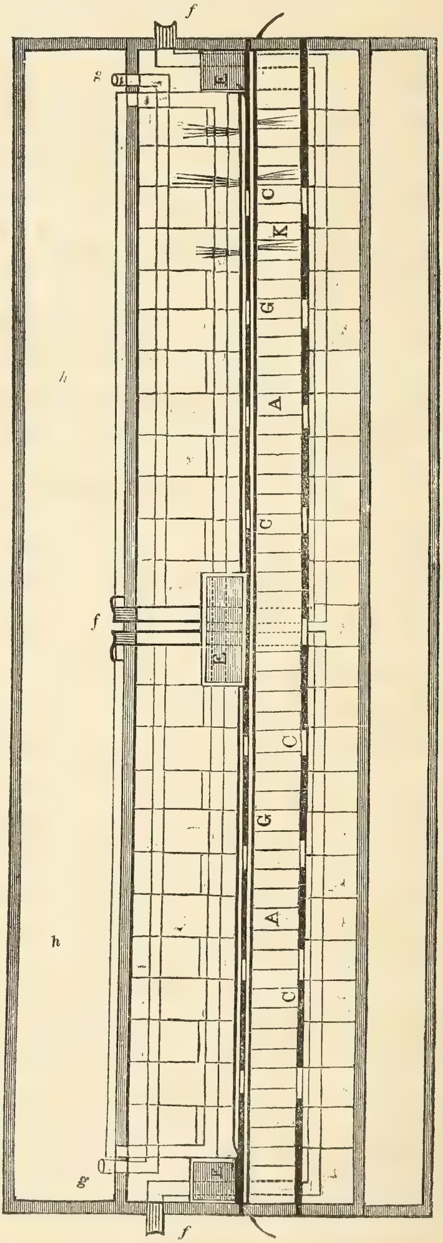
The best time to remove the roots is at the time they are in flower; they may then be packed in moss, and sent with safety to almost any distance.

The house appropriated to the growth of Orchideæ at Chatsworth (see figure), is 75 feet long, and 12 feet 6 inches wide. The walk, *a a*, is composed of pieces of wood nailed to sleepers, and is 3 feet 6 inches wide. The flues are inclosed in hot air chambers, *b b*, and the heat is admitted into the house by means of sliding ventilators, *c c*, on each side of the walk.

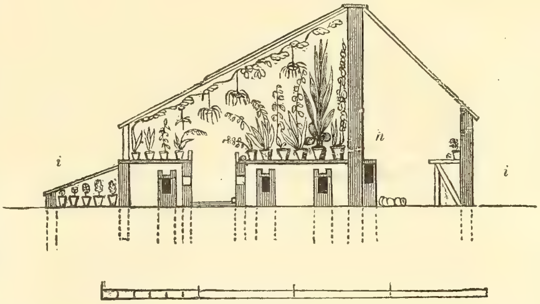
On the top of the hot air chambers the plants are placed, as seen by letter *d* in the section; the stones covering the chamber being always warm, give a gentle heat to the roots of the plants placed on them. The top of the air chambers is 2 feet 6 inches above the level of the floor.

The letters *e e e* show three leaden water cisterns; the two end ones are 3 feet square, the centre one 3 feet wide by 8 feet long, and is occupied by aquatic plants.

There are four fire-places (*f f f*) on the common principle, the two end ones pass into the front chamber, cross under the walk in the centre of the house, pass along the back chamber, and empty themselves at each end, *g g*. The two fires in the back wall, pass once along the front of the back chamber, and crossing through the wall at each end of the house, pass along the outside of the wall, and heating the back sheds (*h*) empty themselves in the centre of the back wall of the house at *f*.



The height of the back wall of the house is 11 feet 6 inches, and that of the front 2 feet 6 inches; on the top of the front wall is an elevation of glass 2 feet 6 inches high, making the front 5 feet high.



In front of the house is a small pit, used for half hardy plants, *i*. The water is conveyed into the cisterns by leaden pipes from a reservoir, and is let on or taken off at pleasure by turning of taps fixed at each end. To readily give humidity to the house, pipes are passed along the house, perforated as at *k*; and when turned on, throw water on the floor, or over the back chamber.

LIST OF FIRST RATE TERRESTRIAL ORCHIDEÆ, WITH THE MONTHS THEY MAY BE EXPECTED TO FLOWER.

Coming into Flower in January and February.

Bletia verecunda.
— florida.
Bletia Shepherdii.
Diuris aurea.

Coming into Flower in March and April.

Bletia gracilis.
— hyacinthina.
Neottia grandiflora.
Phajus grandifolius.
Govenia superba.
Ophrys atrata.
— tenthredinifera.
— fusca.
— lutea.
Stenorhynchus speciosus.

Coming into Flower in May and June.

Acanthophippium bicolor.
Arethusa bulbosa.
Calanthe veratrifolia.
Cymbidium lancifolium.
— aloëfolium.
— ensifolium.
Cypripedium pubescens.
— spectabile.
— macranthum.
— guttatum.
Disa cornuta.
— graminifolia.
Eulophia Guineensis.
Geodorum dilatatum.
— purpureum.
Habenaria ciliaris.
— fimbriata.
Lissochilus speciosus.
Orchis papilionacea.
Ophrys speculum.
— scolopax.
Peristeria elata.
Phajus maculatus.
Pogonia ophioglossoides.
Satyrium carneum.
Stenorhynchus orchioides.

Coming into Flower in July and August.

Calopogon pulchellus.
Cypripedium insigne.
— venustum.
Bonatea speciosa.
Disa grandiflora.
Eulophia streptopetala.

Coming into Flower in September and October.

Cymbidium Sinensis.
Habenaria gigantea.
— cristata.
Geodorum citrinum.
Satyrium coriifolium.
Bletia reflexa.

With regard to the times of flowering stated above, much depends on the state of health in which each plant is, the manner it is or has been treated, and other circumstances. But the above will show a cultivator, who is anxious to have his plants flower, when he may expect to be gratified.

LIST OF FIRST RATE TERRESTRIAL ORCHIDEÆ.

Acanthophippium bicolor. A new and beautiful species.
Arethusa bulbosa. An elegant tuberous rooted species.
Bletia gracilis. A slender growing plant, flowers freely.
—— hyacinthina. A remarkable pretty species, called also Limodorum striatum, Epidendrum striatum *Thunb.* Cymbidium striatum, *Swartz.* Gyas humilis, *Salis;* and Cymbidium hyacinthine, *Smith.*
—— Shepherdii. Limodorum tuberosum. (See figure.)
—— florida. Cymbidium floridum, *Salisbury.* Gyas florida, *Salisb.* Bletia pallida, *Loddiges, Bot. Cab.* 629.
—— verecunda. Gyas verecunda, *Salisb.* Limodorum purpureum, *Redont.* Cymbidium altum, *Willd.* Cymbidium verecundum, *Swartz.* Limodorum trifidum. Limodorum tuberosum, *Jacq.* Limodorum verecundum, *Salisb.* Limodorum altum, *Bot. Mag.* 930, and Helleborine Americana.
—— reflexa. A newly introduced species.
Bonatea speciosa. Is deserving a place in any collection.
Calanthe veratrifolia, *Bot. Reg.* 720. Limodorum veratrifolium, *Willd.* Orchis triplicata, *Willi.* Ambyglottis flava, *Bl.* Flos triplicatus, *Rumph.*
Calopogon pulchellus. Limodorum pulchellum, *Salisb.* Limodorum tuberosum, *Bot. Mag.* 116.
Cymbidium lancifolium. A very handsome species.
———— ensifolium. Limodorum ensatum, *Thunb.* Epidendron ensifolium, *Linn.*
———— Sinensis. Cymbidium fragrans, *Salisb.* Epidendron Sinense, *Bot. Mag.* 888.
———— aloifolium. Epidendron aloifolium, *Linn.* Aërides Borassi.
Cypripedium pubescens, *Bot. Cab.* 895.
———— insigne, *Lodd. Bot. Cab.* 1321. *Bot. Mag.* 3412.
———— spectabile, *Bot. Mag.* 216. *Bot. Cab.* 697.
———— macranthon. Calceolus purpureus speciosus.
———— venustum, *Bot. Reg.* 788. *Bot. Mag.* 2129. *Bot. Cab.* 585.
———— guttatum. A very handsome species.
———— ventricosum. Resembles the Macranthon.
———— humile, *Bot. Cab.* 130. Cypripedium acaule, *Hort. Kew.* *Bot. Mag.* 192.
———— parviflorum, *Bot. Mag.* 3024.
Diuris aurea. An elegant yellow flowering species.
Disa grandiflora. *Bot. Reg.* 926. A splendid species.
—— cornuta. A very handsome kind.
—— graminifolia. A first rate beauty.
Eulophia Guineensis. *Bot. Reg.* 686.
Geodorum dilatatum. *Bot. Reg.* 675. Limodorum recurvum, *Willd.* Malaxis cernua, *Willd.* Otandra cernua, *Salisb.* Cistella cernua, *Blume.*
——— purpureum. Limodorum nutans, *Roxb.* Malaxis nutans, *Willd.*
——— citrinum. *Bot. Rep.* 626.
Govenia superba. Maxillaria superba, *La Llave.*
Habenaria gigantea. *Bot. Mag.* 3374. Orchis gigantea, *Sm.*
——— ciliaris. *Bot. Mag.* 1668.
——— cristata. An elegant kind.

Habenaria fimbriata. *Bot. Cab.* 552.
Lissochilus speciosus. *Bot. Reg.* 573.
——— streptopetalus, *Lindl. Gen. and Sp. Or.* 191. Eulophia streptopetala, *Bot. Reg.* 1002, *and Bot. Mag.* 2931.
Neottia grandiflora, *Bot. Mag.* 2730.
Orchis papilionacea.
Ophrys atrata, *Bot. Reg.* 1087.
——— tenthredinifera, *Bot. Reg.* 205.
——— fusca, *Bot. Reg.* 1071.
——— lutea.
——— speculum, *Bot. Reg.* 370.
Peristeria elata, *Bot. Mag.* 3116. Very beautiful.
Phajus maculatus. Bletia Woodfordii, *Bot. Mag.* 2709. Bletia flava, *Wallich.*
Phajus grandifolius. Bletia Tankervilliæ, *Bot. Mag.* Limodorum Tankervilliæ, *Willd.* Pachyne spectabilis, *Salisb.* Limodorum Incarvillei, *Pers.*
Pogonia ophioglossoides, *Bot. Reg.* 148. Arethusa ophioglossoides.
Satyrium carneum, *Bot. Mag.* 1512.
Stenorhynchus speciosus, *Bot. Reg.* 1374. Neottia speciosa, *Jac.*
——— orchioides, *Bot. Mag.* 1036.

SPECIES AMONGST THE ABOVE THAT ARE HARDY.

Cypripedium spectabile.
——— macranthon.
——— guttatum.
——— ventricosum.
——— humile.
——— parviflorum.
Habenaria ciliaris.
——— cristata.
——— fimbriata.
Orchis papilionacea.
Ophrys speculum.
Cypripedium pubescens.

SPECIES THAT REQUIRE THE GREENHOUSE.

Arethusa bulbosa.
Calopogon pulchellus.
Diuris aurea.
Disa grandiflora.
——— cornuta.
——— graminifolia.
——— maculata.
Ophrys atrata.
——— tenthredinifera.
——— fusca.
——— lutea.
Lissochilus streptopetala.
Pogonia ophioglossoides.
Satyrium carneum.

SPECIES THAT REQUIRE THE STOVE.

Acanthophippium bicolor.
Bletia gracilis.
——— verecunda.
——— hyacinthina.
——— Shepherdii.
——— florida.
——— reflexa.
Bonatea speciosa.
Calanthe veratrifolia.
Cymbidium lancifolium.
——— ensifolium.
——— Sinensis.
——— aloifolium.
Cypripedium insigne.
Cypripedium venustum.
Lissochilus speciosus.
Habenaria gigantea.
Neottia grandiflora.
Peristeria elata.
Phajus maculatus.
——— grandifolius.
Eulophia Guineensis.
Geodorum purpureum.
——— dilatatum.
——— citrinum.
Govenia superba.
Stenorhynchus speciosus.
——— orchioides.

ACANTHOPHIPPIUM.

The A. BICOLOR is not in our collection at Chatsworth, nor are we acquainted with it; but from the figure and description given by Dr. Lindley in the Botanical

Register, t. 1730, we should judge it to be well deserving of extensive cultivation. " It was found in Ceylon by Mr. Watson, the superintendent of the government garden at Peradenia, and transmitted by him to the Horticultural Society. It has very much the habit of a *Geodorum*, only it has pseudo bulbs instead of tubers." The flowers are barrel-shaped, of an orange yellow, blotched at the expanded part with purple and blood red. The flower stem springs a little above the pseudo bulbs, and produces from two to four flowers. " It flowers in June, and succeeds extremely well in a mixture of peat and sand, mixed with broken pots, provided it has a great deal of heat and moisture during the growing season, and a few months' rest annually in a cool and dry atmosphere*."

ARETHUSA.

A. BULBOSA.—This is a greenhouse species of great beauty; the flowers are large for the slender low size of the stem; only one fine lilac coloured flower terminates each stem. This species seldom lives long under cultivation; it thrives best in a soil composed for the most part of peat; the soil requires to be kept very moist, as the plant grows naturally in the swamps of North America. The pots, however, in which it is grown must be well drained, or success is precarious.

BLETIA.

This is a very handsome genus of plants. The *B. gracilis* is a native of Mexico, whence it was introduced by Messrs. Loddiges in 1830. The whole plant is of very slender growth, the flower stem grows about a foot high, and produces three or four flowers. Sepals and petals brownish yellow, labellum light rose colour veined with dark crimson on the upper part, lower part greenish yellow. It requires the stove, and our plants do well potted in sandy peat and light loam. As soon as the leaves die down remove it to a cooler place, where it must be kept dry for three or four months, then repot, and place it in the brisk heat of a damp stove; and when in a state of growth give a good supply of water. It may be increased by division of the roots at the time of potting, on the close of the torpid season.

B. HYACINTHINA.—This species is a native of China, from whence it was introduced in 1812; for beauty this surpasses the last. The flower stem rises about a foot high, and bears from eight to twelve flowers; sepals and petals of a rich purple rose colour, tinged with a brilliant blue, which is perfectly inimitable in art; the labellum is of a lighter colour, and is blotched with dark crimson. Our plants thrive well in a cool part of the stove, potted in a mixture of light sandy loam and peat; it will also grow vigorously in a warm part of the greenhouse. It should be wintered in the same way as the last, and is propagated by division of the roots.

B. SHEPHERDII is a stronger growing plant than either of the ones before mentioned. (See figure and description in page 146).

B. FLORIDA.—Supposed to be a native of Trinidad, and therefore requires the heat of a stove. The flower stem grows two feet high, and bears from ten to twelve flowers. Sepals and petals rose coloured; labellum white, with four or more longitudinal yellow, folding bars extending from the base to nearly the extreme edge.

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* Dr. Lindley, Bot. Reg. t. 1730.

It grows freely with us in loam and peat, and is increased by separating the bulbs. This plant requires a winter like the *B. gracilis.*

B. **Verecunda** is a native of the West Indies, and was introduced many years ago; it very much resembles the last in both its manner of growth and colour of the flowers; the flower stem, however, grows three feet or more high; the plant is of stronger growth, and the colour of the flower of a darker purple. It requires the heat of the stove, and is propagated by separating the roots just after the season of torpidity. Winter it like the *B. gracilis.*

B. **Reflexa.**—This species we do not possess, unless some of our unnamed species should prove to be it. The sepals and petals are greenish yellow, tinged around the borders with purple, and marked with purple veins, and the labellum is purple. It requires the same kind of treatment as other *Bletias,* and may be propagated in the same way.

BONATEA.

B. **Speciosa** is a native of the Cape of Good Hope. The flowers are green and slightly fragrant, without any thing striking as regards ornament, but very remarkable in structure. We keep our plant in a cool part of the stove, but there is no doubt it would grow in the greenhouse. It should be potted in sandy loam and peat, and propagates slowly by division of the roots. After the tops are dead it should be placed in a cool situation, where it will receive no water for three months, afterwards it should be repotted, and placed again in the stove.

CALANTHE.

C. **veratrifolia** is a fine showy species, bearing a pyramidal spike of pure white flowers, two feet or more high. It is a native of the East Indies, whence it was introduced in 1819. It requires to be placed in a cool part of the stove, and should be potted in sandy loam and peat; and at the season of torpidity should be kept cool, and be seldom watered. The mode of propagation is by dividing the root. There is one particular respecting its culture which must not be omitted, viz. that it does not flourish in a system of damp treatment, but the flowers are damped and do not open freely, neither do they appear a clear white. To avoid this, place the plants in an airy light part of the stove, where there is little humidity, and never saturate it with water.

CALOPOGON.

C. **pulchellus** is a very hardy greenhouse plant, a native of North America, introduced to this country many years ago. The flower stem grows from a foot to a foot and a half high, and bears three or four purple flowers. It will grow in peat and loam, and may be propagated by separating the tuberous roots.

CYMBIDIUM.

C. **lancifolium** is a native of the East Indies, whence it was introduced in 1822. The flower stem grows erect, and produces from four to six flowers; sepals white, tinged with yellow; petals yellowish white, tinged with rose-colour; lip of the same colour, but spotted with crimson. This plant thrives in a mixture of peat and loam, requires constantly the heat of the stove, and is propagated by division of the roots.

C. ENSIFOLIUM is a native of China, and was introduced many years ago. The flower stem grows from two to three feet high, and bears from four to eight fragrant flowers. The sepals and petals are yellowish green, with brownish purple veins, and the labellum is spotted with purple. It requires the same treatment as the last.

C. SINENSIS.—This is also a native of China, whence it was introduced in 1793. The flower stem grows from a foot and a half to two feet high, and produces from six to ten fragrant flowers. Sepals and petals of a brownish purple, and the labellum is of a greenish yellow, and spotted with purple.

C. ALOIFOLIUM.—A native of the East Indies, where it grows upon trees, whence it was introduced in 1789. It is a very handsome species. The flower stem springs from the root, and hangs gracefully pendent, is from one foot to eighteen inches long, and produces many flowers. Sepals and petals pale purple, striped down the centre of each with a longitudinal dark bar. Our plants thrive well in turfy peat soil, treated nearly after the manner of *Epiphytes.* All the species of *Cymbidium* are stove plants, and are propagated by division of the roots.

CYPRIPEDIUM.

C. PUBESCENS.—All the plants of this genus are very beautiful, the pubescens is elegant; the flower stem grows about a foot high; the sepals are yellowish green, shaded with brown, and the slipper-shaped labellum is a rich golden yellow. It is a native of North America, where it is said "to grow on the sides of stony hills that are covered with underwood and small trees, which admit the sun through their leaves and branches to the ground *." It is always considered rather difficult to cultivate, and although it is a perennial it often dies without any apparent cause. The best soil for it is equal parts of sandy peat and rotten vegetable mould found at the bottom of a hollow tree; but if this last cannot be obtained, mix a portion of rotten sawdust with light loam. It is propagated by separation at the roots.

C. INSIGNE.—This is a splendid species of *Cypripedium,* perhaps equalled by none yet discovered, certainly not surpassed; it is a native of Nepal, and was introduced by Dr. Wallich, some years ago. The sepals are yellow green, spotted and striped with rich brown; and the labellum is orange yellow, tinged on the outside by the same rich brown. It requires the stove, and may be planted in the rotten soil from the bottom of a tree, mixed with equal parts of sandy peat, and may be increased by separation at the roots.

C. SPECTABILE.—This, in point of beauty, is little behind the last, and the flower is nearly as large. It is a native of the bogs and low meadows of North America; it has been grown in this country many years, but is rather difficult to keep. It is perfectly hardy, and should be potted in the same compost as recommended for the *pubescens* and *spectabile.* The sepals are pure white, very delicate, and the labellum a bright soft crimson.

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* Botanical Cabinet, 895.

C. MACRANTHON.—A fine species, a native of Siberia, from whence it was introduced by Dr. Fischer of St. Petersburgh. The sepals and labellum are of an uniform rosy purple, beautifully veined. It is perfectly hardy, and may be potted and otherwise treated like the other hardy species of this genus.

C. VENUSTUM.—This is a singular plant, a native of Nepal, introduced in 1816. The leaves are singularly spotted, both above and beneath; the whole plant, including the flower stem, grows from six to nine inches high, bearing at the top a single flower of a yellowish green colour, tinged with bright red, and spotted with a rich brown; the outside of the labellum also is of a light brown, veined with a darker colour. It requires the heat of the stove. It will require the same kind of treatment as the other stove *Cypripediums.*

C. GUTTATUM.—This species I have not seen, but from what I have heard, I believe it to be a very good kind. It is a native of Siberia, is perfectly hardy, and should be potted in light sandy peat and vegetable earth, as recommended for the others.

C. VENTRICOSUM.—This bears a great resemblance to the *macranthon,* but is rather darker in the colour of the flower; it is also a native of Siberia, and was introduced in 1828, is perfectly hardy, and may be cultivated the same as the *macranthon.*

C. HUMILE.—This species grows about six inches high, the flower is rose-coloured, and very handsome. It is a native of North America, and has been introduced many years, but is still very scarce, in consequence of its propagating very slowly, and the plants dying off so soon, even with the greatest attention. The soil it seems to thrive best in is sandy peat, and, though pretty hardy, is apt to go off in the cold weather of spring; the best way is to give it shelter in very cold weather, either in a frame or by placing a handglass over it.

C. PARVIFLORUM.—The flowers of this species are very handsome, and delightfully fragrant, bearing some resemblance in colour to the *C. pubescens,* but are smaller. The sepals are purple, and the labellum a brilliant yellow. It is a native of North America, and was introduced so long ago as 1790, but is still far from plentiful. It is perfectly hardy, and should be potted in sandy peat and vegetable earth, and is propagated like the rest by dividing the root.

DIURIS.

D. AUREA.—This a native of New South Wales, and is therefore a greenhouse plant. The flower stem rises about a foot and a half high, and produces from three to six bright yellow flowers. It should be potted in loam and peat, and may be propagated by dividing the roots.

DISA.

D. GRANDIFLORA.—This most splendid species is a native of the Cape of Good Hope, from whence it was received into this country by W. Griffin, Esq. of South Lambeth, in 1825. It grows about a foot high, and produces two or three flowers of a bright crimson colour in the two lower segments, and relieved with a pale delicate pink, spotted with a darker colour in the upper one. It is rather difficult to cultivate, being in the first place very impatient of wet, and, in the second place, will not bear the least moisture during the period of torpidity. The most suitable soil for it is very sandy soil; and the mode of propagation separation of the tubers.

D. cornuta is a very different plant to the last, the flowers being much smaller, and being produced on a spike a foot and half or two feet high, and the colour of a pale blue. It requires the same kind of treatment as the last.

D. graminifolia is also a native of the Cape, from whence it was introduced in 1825; it is a very splendid species; the flower stem grows about a foot and a half high, and produces three or four bright blue flowers. This requires the same treatment as the *cornuta* and *grandiflora.*

EULOPHIA.

E Guineensis is a native of Sierra Leone, whence it was introduced in 1822. The flower stem grows a foot or more high, and produces from eight to twelve flowers; the sepals and petals are brownish green, and the labellum a light pink colour. It requires the heat of the stove, and should be potted in a mixture of loam and peat.

GEODORUM.

G. dilatatum. A native of the East Indies, from whence it was introduced by Sir Joseph Banks. The flower-stem rises a foot high, and bears at its extremity a cluster of pink flowers, the weight of which causes the stem to droop gracefully. It requires the stove, and should be potted in a mixture of loam and peat.

G. purpureum. This is also a native of the East Indies, and was introduced by Sir Joseph Banks at the same time as the one above; it grows about the same height as the other, but has purple flowers. The treatment is precisely the same as for the *dilatatum.*

G. citrinum. This species has yellow flowers, was introduced at the same time as the last, by Sir Joseph Banks, and requires precisely the same kind of treatment.

GOVENIA.

G. superba. Is a native of Xalapa; introduced in 1828. The flower-stem rises before any leaves make their appearance, and grows about a foot high, producing abundance of yellow flowers, having a very delicious fragrance. The best soil for it is rotten vegetable soil from the bottom of an old tree, and a small portion of sandy peat. It requires the heat of the stove.

HABENARIA.

H. gigantea. This is a fine species, with large white flowers of a pleasant fragrance; but not having seen it flower, I am unable to state particulars respecting it. The plant is a native of Bombay.

H. fimbriata is a hardy species, a native of North America. The flower-stem grows about a foot high, and produces numerous purple flowers, the lip is fringed also with purple. It is rather difficult to cultivate; but will grow in well drained pots of peat, and should be sheltered from excessive wet in winter, in a frame.

H. ciliaris. This is also a native of North America, from whence it has been introduced many years. The flowers of this are yellow, and the labellum is fringed with the same coloured fringe; and the treatment is precisely the same as the last.

H. CRISTATA is a native of North America, bears yellow flowers, and requires the same treatment as the *fimbriata*.

LISSOCHILUS.

L. SPECIOSUS. A native of the Cape of Good Hope, from whence it was introduced by Mr. Griffin, in 1818. To grow it to perfection, it requires the heat of a stove. The flower-stem rises four or more feet high, and produces abundance of yellow flowers; a figure of which we have prepared, and will be inserted shortly. The best soil is a mixture of light loam and peat.

L. STREPTOPETALUS. This is also a native of the Cape of Good Hope, and was introduced in 1820. It should be kept in a cool part of the stove, or in a warm situation in the greenhouse. The flower-stem grows nearly two feet high, and produces numerous yellow flowers. Our plants grow freely in sandy peat and light loam.

NEOTTIA.

N. GRANDIFLORA. None of the Neottias are much ornament. This species is a native of Brazil, and of course requires the heat of the stove. The flowers are green, produced on a stem about a foot and a half high. The best soil is sandy peat and loam; and the mode of propagation by division of the roots.

ORCHIS.

O. PAPILIONACEA is a handsome hardy species, a native of the South of Europe. It has been long an inhabitant of our gardens, and may be grown in a mixture of loam and peat.

OPHRYS.

O. ATRATA. This is a native of the South of Europe, from whence it was introduced so lately as 1825. The lip is a very dark purple; and the appearance of the flower remarkably curious. It is nearly hardy, and should be grown in sandy loam; and may be increased by separating the roots. In the winter it should be sheltered in a frame.

O. TENTHREDINIFERA. The flower-stem of this grows from six to nine inches high. The sepals of the flowers are rose colour, and the labellum yellow with a brown blotch. There is also a dwarf variety, being somewhat lighter in colour. They are natives of Barbary, Sicily, and Corsica, and should receive the shelter of a frame, where they will grow well, if potted in a light sandy soil, and watered with care.

O. FUSCA. This is a native of Gibraltar, where roots of it were collected by Col. Chapman, and sent to England in 1825. It will grow in any common light soil, and must be sheltered in a frame or cold greenhouse.

O. LUTEA is a native of Spain, from whence it was introduced in 1818. The flowers are yellow, and are produced on a stem about nine inches high. It requires the same treatment as the last.

O. SPECULUM. One of the prettiest of this genus; a native of Portugal: introduced in 1818. It requires a slight shelter, and will grow in any light sandy soil, requiring the same treatment as the others.

PERISTERIA.

P. ELATA. This is a splendid species; a native of Panama, from whence it was sent to R. Harrison, Esq., of Liverpool, by H. Barnard, Esq., in 1826. The flower-stem springs from the base of the large pseudo-bulb, and grows four feet or more high; and producing many yellowish-white waxy flowers, of pleasant fragrance. The inside of the flower bears a striking resemblance to a dove with its wings expanded. This species requires the heat of the stove, and should be potted in a mixture of rotten vegetable earth and sandy peat; and must not be over watered at any time of the year.

PHAJUS.

P. MACULATUS. A fine species, native of Nepal. The flower-stem rises two feet or more high, and produces ten or twelve yellow-green flowers. It requires the heat of the stove, but is impatient of over dampness, and should therefore be placed in any cool airy part. It should be potted in loam and peat.

P. GRANDIFOLIUS, or *Bletia Tankervilliæ,* is so well known, and the culture so easy, that it is unnecessary to say anything about it here.

POGONIA.

P. OPHIOGLOSSOIDES. A native of North America, brought into this country in 1816. It requires the shelter of the greenhouse or frame, should be potted in sandy loam and turfy peat, and is propagated by division of the roots.

SATYRIUM.

S. CARNEUM is a native of the Cape of Good Hope. The flower-stem grows about eighteen inches high, and produces numerous pink flowers. It requires the protection of the greenhouse, and should be planted in well-drained pots, filled with sandy peat.

STENORHYNCHUS.

S. SPECIOSUS. This is a very beautiful species, a native of the West Indies, from whence it was introduced in 1790. The flower-stem grows about a foot high, and is thickly clothed more than half that length with brilliant scarlet flowers. It is a herbaceous plant, and may be increased by division of the roots.

S. ORCHIOIDES is also a very charming kind. The flower-stem grows taller than that of the last, reaching about a foot and a half, and producing numerous flowers. It requires the same treatment as the last; viz. the heat of the stove, to be potted in sandy peat soil, well-drained, and increased by division of the roots.

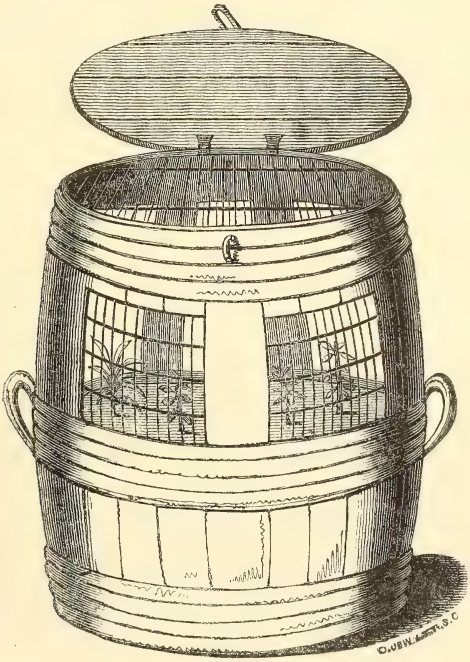
A FEW MORE REMARKS ON PRESERVING PLANTS AND SEEDS ON A SEA VOYAGE.

In addition to what has been stated, Vol. 1, p. 260, and Vol. 2, p. 90, a few more remarks may be made. To ensure success, great care is requisite, not only to select good plants, but to remove them properly; and, if possible, allow them to grow in their boxes for some months previous to being shipped.

A correspondent of ours having had occasion to send plants to the West Indies, has hitherto been very successful. The method he recommends is to get a common flour barrel, with the top out. The pots of plants are firmly fixed at the bottom, by a bar being placed across the top of the pots. A few bars of wood are put across the upper end of the barrel, and a piece of tarpaulin is nailed to the side of the barrel, like a flap, to cover the top in bad weather; also, a few holes are bored with a large augre in the sides, to prevent the possibility of the plants being entirely secluded from air.

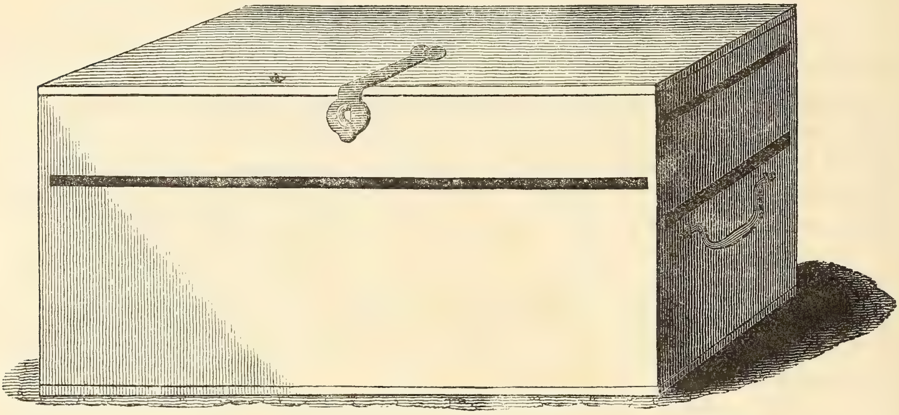
In sending plants from the East India Company's garden, Calcutta, the kind of chests and boxes used resemble the following:—

A.



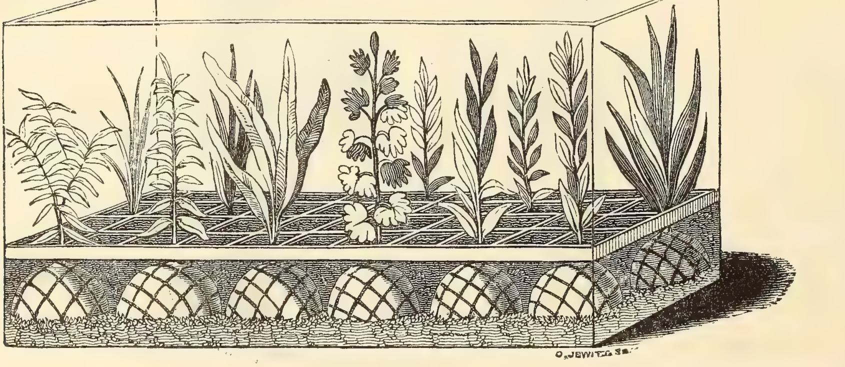
A is a cask for sowing East India seeds, with the openings defended by wire, and a lid which can be opened and shut as circumstances may require. The wire will defend the plants from the depredations of rats, or being plucked by any persons. is a box with West India and West Florida plants, shut down; the broad black

B

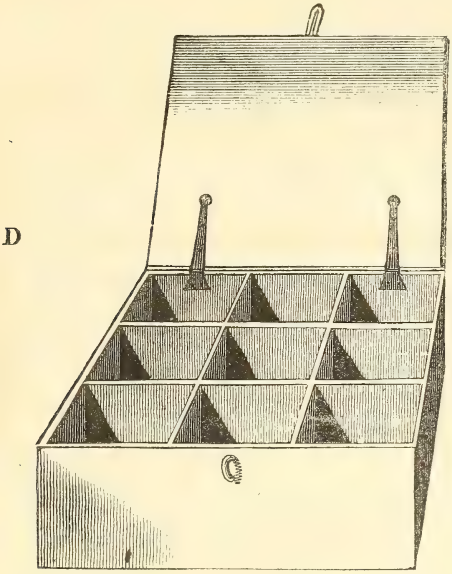


bands at the ends and front are intended to show openings by which fresh air is admitted to the plants. These openings are too contracted to admit rats, and the lid may be securely locked. C shows the inside of the box, with the manner of

C



securing the roots of West Florida and West India plants, surrounded with earth and moss, tied with pack-thread, and fastened cross and cross with laths or pack-thread, to keep them steady. D is a box, with divisions for sowing different seeds in earth and chopped moss, from the southern colonies and the West Indies.



Seeds packed in bran or charcoal, put in linen bags, and placed in a box where the air will not be entirely excluded, will keep for a long time.

NOTICE OF BEAUTIFUL NEW PLANTS, FIGURED IN THE THREE LEADING BOTANICAL PERIODICALS, FOR JUNE.

Botanical Register, edited by Dr. Lindley; each number containing eight figures: coloured, 4*s.*, plain, 3*s.*, and corresponding letter press.

Botanical Magazine, edited by Dr. Hooker, each number containing eight plates: coloured 3*s.* 6*d.*, plain, 3*s.*

British Flower Garden, edited by Mr. David Don, containing four plates: coloured, 3*s.*, plain, 2*s.* 3*d.*

Of these twenty monthly figures we have only selected such as are new and worthy of culture. For descriptions and figures, reference must be made to the works themselves.

THE HEATH TRIBE (ERICEÆ).

Rhododendron (Azalea) nudiflorum eximium (Choice Rosebay). This is another splendid production, raised by Mr. William Smith, in 1829, from seeds of the variety *coccinea major* of *Rhododendron* (*Azalea*) *nudiflorum* that had been fertilised by *arboreum,* and except in its evergreen leaves, and decandrous flowers, it agrees almost entirely with the former species. The plant appears to be quite hardy, is readily multiplied by layers, and, from the beauty of its crimson flowers, is well deserving of a place in every garden.—*Brit. Flower Garden,* 291.

THE CRUCIFEROUS TRIBE, OR PLANTS BEARING FLOWERS WITH FOUR CALYX LEAVES AND FOUR PETALS DISPOSED IN THE FORM OF A CROSS (CRUCIFERÆ).

Morisia hypogæa (Ground Cress). This plant is apparently perennial, and forms a little compact tuft, bearing bright yellow flowers. Introduced by Mrs. Palliser, from the Royal Botanic Garden at Turin, from seeds presented to her by Professor Moris, who discovered the plant on the mountains of Sardinia. It is quite hardy, and appears well suited for rockwork, where its numerous bright yellow blossoms, contrasted with its deep green polished leaves, would doubtless produce a good effect. It requires a light loamy soil, and is readily increased by seeds, which should be sown immediately after they are ripe.—*Brit. Flower Garden,* 290.

THE VERVAIN TRIBE (VERBENACEÆ).

Verbena multifida contracta (Dwarf Purple Vervain). One of the commonest of all plants on the Alps of Chili and Mendoza, growing, according to Dr. Gillies, at the elevation of 8000 feet above the level of the sea; and varying extremely in the colour of its flowers, in stature, and in the degree in which the leaves are cut. This is a dwarf kind with purple flowers.—*Bot. Reg.* 1766.

THE GESNERA TRIBE (GESNEREÆ).

Gesnera allagophylla (Shifting-leaved Gesnera). A stove plant supposed to be a native of Brazil. The flowers are reddish orange; and it is a pretty neat species, and an interesting addition to the showy and easily cultivated genus to which it belongs.—*Bot. Reg.* 1767.

THE FIGWORT TRIBE (SCROPHULARINEÆ).

Pentstemon staticifolius (Sea-Lavender-leaved Pentstemon). A new hardy species of this beautiful genus, sent to the Horticultural Society by the late Mr. Douglas from California. The flowers are purple.—*Bot. Reg.* 1770.

NEW ORCHIDEA.

TRIBE EPIDENDREÆ.

Epidendron stenopetalum (Acute Petaled Epidendron). This pretty Orchideous plant was received at the Glasgow Botanic Garden, by favour of Mr. Macfadyer. The flowers are a delicate rose colour.—*Botanical Magazine,* 3410.

NOTES ON THE FOREST SCENERY OF NORTH AMERICA,

MADE BY MR. JAMES M'NAB, OF THE BOTANIC GARDEN, EDINBURGH, AND MR. R. BROWN, LATE OF PERTH, DURING A JOURNEY TAKEN FOR THE EXPRESS PURPOSE OF OBSERVING THE CHARACTERS OF TREES IN THEIR NATURAL WOODS.

Extracted from the Quarterly Journal of Agriculture.

Every individual who has been accustomed, during his home travels, to pay any attention to the forest scenery in his native country, must be astonished at the great difference which a foreign land presents.

In tropical regions, the whole aspect of a country is changed by the total alteration in habit, and the luxuriancy of the forests, compared with those seen in temperate climates.

In North America the forest scenery is sublime, and upon a very extensive scale. When looked upon by the inexperienced observer, it may not seem to afford forms different from what he has been accustomed to witness in other countries; but the practised eye must at once perceive the wonderful difference of form which the American trees present.

Before landing upon the shore at New York, the head-lands appear to the stranger from the old country of a very dark and dismal hue, from the quantity of pines and red cedars (*Juniperus Virginiana*), which seem to be the chief inhabitants of the soils around; but on landing, the whole city and neighbourhood seems like a vast garden, from the number of beautiful trees, which either grow spontaneously, or have been introduced into the avenues of the city from more southern climes.

It is here that the observing stranger is first impressed with the great diversity of form and the variety of foliage furnished by American trees; but it is not to be expected that throughout the country this diversity of form is everywhere to be seen. It is much the contrary. Near the large cities none of the natural forests remain, nor can they be expected till we penetrate beyond the reach of internal communication of rivers and lakes: for the demand of wood, as fuel and otherwise, in the neighbourhood of such places, is very great.

About Hobochen, in New Jersey, many very ornamental forest trees of great size are seen, and frequently covered to their summits with wild vines. Of these the *Platanus occidentalis* (button wood or false sycamore), *Liriodendron tulipifera* (white wood or tulip tree), *Liquidambar styraciflua* (sweet gum), with some splendid oaks, chestnuts, limes, and honey-locusts (*Gleditschia triacanthos*), are pre-eminent. There are also many magnificent Catalpa trees (*Catalpa syringifolia*), with a great number of fine old weeping willows and Lombardy poplars. These last appear to be universal favourites, for they are everywhere to be seen, and are indeed almost the only exotic forest trees which the Americans think of planting. These Lombardy poplars, from their great abundance, give to a place a very curious but by no means a picturesque appearance.

All over the northern parts of New Jersey the soil is good, and the vegetation very various. In the southern parts, however, the soils are poor, and covered chiefly with pines, red cedars, and scrub oaks. The swampy grounds abound with white cedars (*Cupressus thyoides*), and around the borders of the swamps, the *Magnolia glauca, Kalmia latifolia, Rhododendron maximum,* with many varieties of *Azalea viscosa, Andromedas,* &c., are seen in great abundance.

Proceeding from *New York* by steam-boat up the Hudson River towards Albany, the scenery is romantic and varied, both from the irregularity of surface and from the ornamental nature of the trees which in many parts grace its banks. Leaving the city upon our right, we dash along as if on the surface of a lake, no outlet being seen, from the innumerable twists and turns which the river takes. The banks for many miles up are covered with brushwood, the larger trees having been mostly cut down. On the left, which is the New Jersey side, the land for many miles is very bold, having shelving rocks, towering 300 feet above the river, and clothed with red cedars.

At *Tappan Sea,* twenty-five miles up, the river attains a considerable breadth. On the right the land is laid out in fields for the cultivation of grain. Many apple and pear orchards are mingled with these fields, and produce a curious effect from the trees being placed at regular distances, and having large tufted round tops.

Passing *West Point,* fifty miles from New York, the scenery assumes quite a Highland appearance ; the hills are seen elevated high above the waters, and their round summits densely studded with cedars ; two miles further up, the scenery is changed from a highland to that of a lowland description ; and many cultivated farms are again seen extending back into the country on both sides. On the most worthless spots by the river side, for the last forty miles, red cedars were predominant; and where soil existed in any quantity, oaks were interspersed.

About *Hampton,* sixty-seven miles up, we got into a great limestone country; and the change from the dark hue of the red cedar to the fine lively green of the Arborvitæ (*Thuja occidentalis*), is at once most striking. These trees are all self-sown over the surface of the rocks and along the water's edge; in general they are finely shaped pyramidal specimens, varying from one to twenty feet in height.

At *Poughkeepsie,* still farther up on the right, a difference begins to show itself, the grounds being now ornamented with a few exotic trees, or mixed with the indigenous ones are seen the Huntingdon and weeping willows, with Lombardy poplars; all much planted by the proprietors, both by the water's edge, and interspersed amongst the native woods.

Passing *Hyde Park* to *Rhinbeck*, the same spirit for planting a few ornamental trees seems to have prevailed; and among them were catalpas, which at this season of the year (July), presented an interesting appearance, from the quantity of flowers which they displayed. Here, for the first time, the Catskill Mountains are seen towering high upon the left at a great distance. They are evidently wooded to the summit. Continuing onwards, on both sides, many beautiful residences are passed; and the cultivated land extends, with well-defined edges, to the river, till within a mile of Albany, where the river gets much broken with islands, and the banks become low, but not destitute of that shade which is so characteristic of American scenery.

Between *Albany* and Lake Champlain, the ground in general is in an excellent state of cultivation; and, being well watered, is rendered, in consequence, an agreeable situation for the settler. There it was that we first caught a sight of the *Abies Canadensis* (hemlock spruce), and the lofty white-barked American elms, in native stations.

Entering another steam-boat upon *Lake Champlain,* from the westward, the course is winding and narrow. The woods on both sides, for the first sixteen miles, are very various, the principal trees being the wild cherry (*Prunus Virginiana*), elms, walnuts, sugar-maples, with the aspen poplar (*Populus tremuloides*). The rocky grounds again abound in the arborvitæ. After having fairly entered upon the expanse of the lake, the appearance of the lofty white or Weymouth pine (*Pinus strobus*), towering above the deciduous trees, on rising grounds at the base of the hills, of a dark aspect, nearly destitute of branches, was remarkable.

About *Essex,* half way along, the lake widens much, and all at once the wooded rocky lane by the water's edge is changed for a rich fertile country. The different farms having their fields laid off in squares, and a large orchard attached to each, render this tract, with its natural beauties, very agreeable. The soil around seemed a light-coloured clay, and the wood on the lower grounds was not very plentiful; but the rising grounds behind were densely studded with scraggy pines.

On reaching *St. John's*, the northern extremity of Lake Champlain, the forests presented the same appearances as they did when we first entered upon the Lake, with the addition of the *Abies balsamea* (or Balm of Gilead fir), and the sugar-maple, which is here in greater quantities and larger than we had hitherto seen. Notwithstanding the great mutilation which the trees are subjected to in early spring, for their juices in the manufacture of sugar, they appear all in the most perfect state of health.

Passing onwards to *Lapraire*, on the St. Lawrence river, the only tree observed of any interest, and deserving of notice, was the Canoe birch (*Betula papyracea*). Several dense masses of these trees occupied the lower ground; but from their closeness, none had attained a great size. Till reaching this point birches were by no means plentiful.

OPERATIONS IN THE FLOWER GARDEN FOR AUGUST.

Anemones, planted in the beginning of this month, will flower about the end of November, or in December, and will continue to flower till Christmas. If planted at the end of the month they will scarcely bloom before February; or, if the season be very cold, the beginning of March. Vol. II. p. 16.

Biennials.—Several of the hardy species, as *Erythræa aggregata, Eutoca multiflora,* and *Franklini,* &c., ripen their seed this month, and should be sown as soon as ripe; also, this is a good time for sowing many of the more tender kinds. Vol. I. p. 66.

Cinnamon.—Cuttings of this plant may now be put in with success. Vol. I. p. 147.

Chrysanthemums.—The young plants, intended to flower in the greenhouse or conservatory next November, should now be potted in good-sized pots, and be regularly watered with a mixture of soap-suds and manure water, and continue to supply it till the flowering season is over.

Gardenia florida.—The young plants, struck last spring, and which have been growing in a brisk moist heat, will now have formed their flower-buds, and should, therefore, gradually be inured to the temperature of the greenhouse, until the time it is thought fit to bring them into flower.

Gladioli, now done flowering, must have very little water until the tops are dead, when it must be discontinued altogether.

Hearts-ease.—Sow the seeds as they are gathered this month, on beds of light sandy soil, and cover them lightly. Vol. I. p. 116.

Ipomopsis elegans, and picta.—Seeds of these species, sown about the beginning of this month, and nursed through the winter in a frame or greenhouse, will flower very finely the following June.

Mignonette, for early spring flowering, should be sown about the third week in August. The pots in which it is sown should be placed in a frame, as recommended, Vol. II. p. 6.

Petunia violacea.—Cuttings of this plant, if not put in last month, should be planted early in this, in small pots, for sheltering in frames through the winter. The design of this is to prepare a stock for the flower borders the following spring.

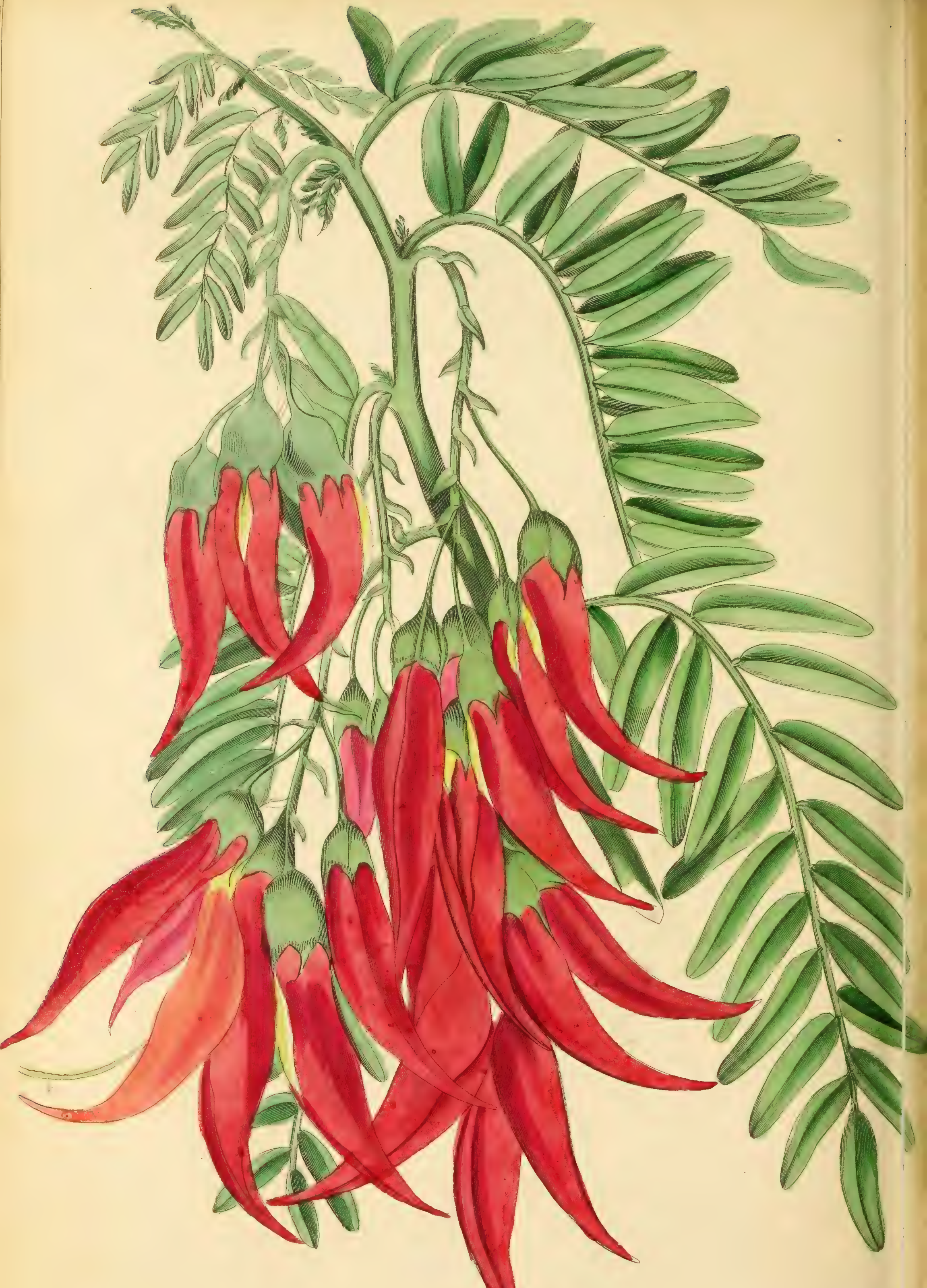
Pomegranates.—Well-ripened cuttings, planted in pots of sandy loam and peat, covered with a hand or bell-glass, and placed in a shady part of the greenhouse or stove, will strike if put in this month. Care must be taken not to suffer them to become mouldy during the winter. Vol. I. p. 64.

Schizanthus retusus, and some other species, make the finest plants if sown the first week in this month, and preserved through the winter in a frame or cool airy greenhouse. Vol. I. p. 5.

Stocks, to flower early in spring, should now be sown in 48-sized pots, filled with light soil, and be placed on a south-east or west border until they are up. When cold weather advances they should be sheltered in frames. Vol. II. p. 31.

Sweet Williams.—Early in this month, if convenient, remove the seedlings to the situations where they are to flower; if not convenient to do so, let them remain in the seedling bed till spring. Vol. I. p. 67.

Verbena Melindres.—Put in cuttings of this plant early in the month, to be preserved through the winter, in a frame or greenhouse, for the flower borders next spring; also, re-pot those struck last May, that they may become fine plants for early flowering next year. Vol. I. p. 174.



Clianthus puniceus.

CLIANTHUS PUNICEUS.

(CRIMSON GLORY-FLOWER.)

CLASS.	ORDER.
DIADELPHIA.	DECANDRIA.

NATURAL ORDER.
LEGUMINOSÆ.

Generic Character.—*Calyx* five toothed. *Vexillum* turned backwards, and ending in a point, shorter than the keel. *Stamina* ten, all fertile, diadelphous. *Pod* inflated, many seeded. *Seeds* kidney-shaped.

Specific Character.—A smooth branching shrub, growing about three or four feet high. *Leaves* pinnate, with an odd one, *leaflets* oblong, blunt, bright green colour above, bluish beneath. *Raceme* pendulous, many-flowered. *Calyx* bright green, cut into five sharp pointed teeth. *Vexillum* dark crimson, having a few longitudinal white marks at the base. *Wings* dark crimson, blunt, rather shorter than the vexillum. *Keel* bright crimson, tinged with orange, approaching to light yellow at the base, much longer than the wings.

Synonyms.—Donia punicea.—*Don*, *Mill. Dict.* ii, 468.

This new and most beautiful shrub is a native of New Zealand, whence seeds of it were sent to this country by the Missionaries in that part. The native name is "*Kowaingutu Kaka*," or Parrot's Bill, most probably called so from the shape of the flower just before it becomes fully expanded, when it bears resemblance to the bill of a bird. In the Horticultural Transactions, the following excellent account of this fine plant is given, and being nearly all that is known about it we shall extract it as it stands :—

"When planted in a peat border in the open air, where it succeeds best, it forms a half herbaceous evergreen shrub, not very unlike an evergreen vetch, or, more correctly speaking, a scarlet *Colutea* (*Sutherlandia frutescens*). Its leaves are smooth, pinnated, and of rather a succulent texture, consisting of about eight pairs with an odd one."

"The stem is entirely free from furrows or angles. The flowers grow in oval clusters, hanging down from the axils of the leaves upon the lateral branches; each flower is rather more than three inches from the tip of the standard to the top of the keel; the petals are of a light bright rich crimson, without any mottling or marking; the standard, which is of a ovate-lanceolate figure, and much tapered to the point, is reflexed so as almost to lie back upon the calyx; the wings are very much shorter than the keel, the point of which is so much prolonged as to look like the beak of some bird, although it must be confessed not much like that of a parrot.

"The flowers are succeeded by brownish black pods, two inches and a half long, seated on a slender stipe, and convex on the upper instead of the lower edge; so that unless attention is paid to their manner of growth, it would seem as if the seeds grew to the lower instead of the upper edge. They are covered all over inside with a delicate cottony down, in which lie the small kidney-shaped seeds, of a dull yellowish ochre colour, mottled with small dark brown blotches and speckles."

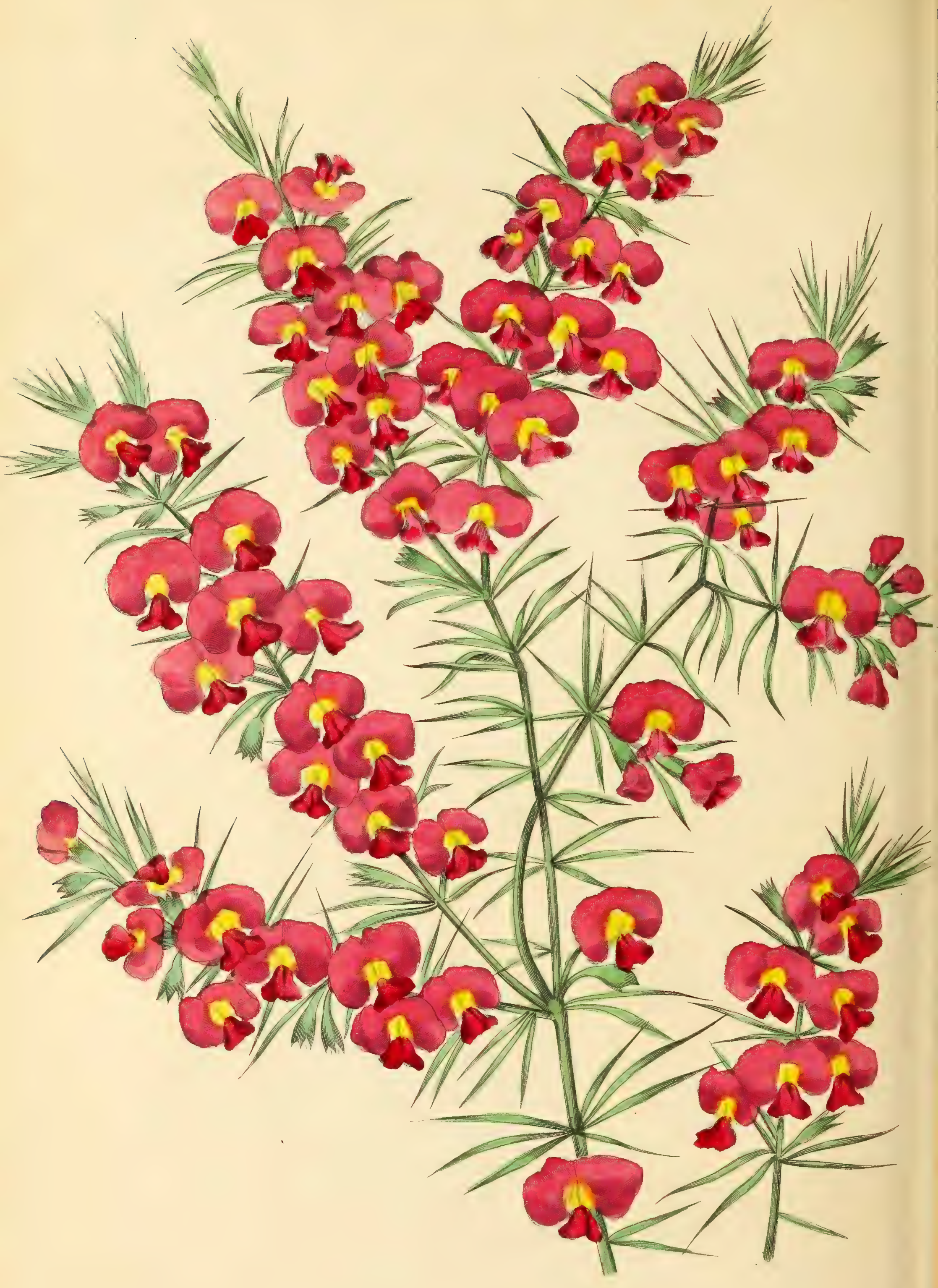
The plant from which our drawing was taken is in the possession of Messrs. Young, of Epsom, who have a stock of young plants for sale, we believe at about three guineas each. We may add to the above description, that the stem of the plant grows as thick as a hen's egg, and the racemes of flowers are produced at almost every axil, making the plant a complete picture of flowers; as many as fifty racemes being borne on one branch. The colour of the flowers on the plant from which our drawing was made was far more brilliant than the specimens represented either in the *Horticultural Transactions* or the *Botanical Register;* indeed we understand the colour begins to change very soon after the flowers are separated from the plant. The season of flowering appears to be from the beginning of April until the middle of June.

" From the trials that have been made of the proper mode of managing it, both by Mr. Gower and the Rev. John Coleman, by whom it was given to the former gentleman, it would appear that it succeeds best when treated as a hardy plant, and turned out into a peat border; for in such a situation it has now been two years in Mr. Gower's garden, Titsey-place, near Godstone, and the plants continue to look very healthy, with a profusion of blossoms forming for next year.

" Kept in a greenhouse it was sickly, and did not flower in the hands of Mr. Gower's gardner; but Mr. Coleman succeeded in blossoming it in a large pot in the greenhouse, and in inducing it to ripen its pods.

" Considering that the climate of New Zealand is in some places like that of England, that some species, such as *Edwardsia microphylla*, will bear the rigour of our winters, it is not impossible that this may also prove a hardy plant. If so, its extraordinary beauty will render it one of the most valuable that has been introduced of late years; and even if it should be no hardier than *Sutherlandia frutescens*, it will still form one of the most important and welcome of all the modern additions to our flower-gardens."

The generic name is derived from the Greek words *kleios* glory, and *anthos* a flower, literally *Glory-flower*. And the specific name *puniceus* alludes to the colour of the flower.



Chorizema Henchmannii.

F.W. Smith sc.

CHORIZEMA HENCHMANNII.

(MR. HENCHMAN'S CHORIZEMA.)

CLASS.	NATURAL ORDER.	ORDER.
DECANDRIA.	LEGUMINOSÆ.	MONOGYNIA.

GENERIC CHARACTER.—*Calyx* five parted. *Corolla* consisting of three petals. *Keel* inflated, shorter than the wings. *Pod* inflated, many seeded.

SPECIFIC CHARACTER.—A greenhouse shrub of great beauty. *Leaves* hairy, bluish green, needle.shaped. *Flowers* produced thickly towards the extremity of the branches; axillary, usually in pairs, but sometimes singly. *Calyx* two lipped, the lower lip cut into three parts, the upper one into two. *Vexillum,* or upper petal, much larger than the other petals, yellow at the base, and the rest a rich crimson-purple, inimitable by art. *Wings* somewhat sickle-shaped, longer than the keel, of a crimson-purple. *Keel* of a paler colour than the wings.

THIS beautiful species is a native of New Holland, where it was discovered by Mr. William Baxter, who collected the seeds and introduced the plant to this country in 1824. Notwithstanding its beauty, and the length of time it has been in this country, the plant is far from being common, this is the more surprising, when we take into consideration the ease with which this kind of plants is cultivated.

The culture is very simple, the plants merely requiring to be potted in a mixture of equal parts of peat and loam, with a little fine sand, and to be kept in an airy greenhouse.

It is easily propagated by cuttings, which should be planted in pots of sand, and covered with a glass, and subjected to a gentle heat. But the best way is to grow it from seeds, which are usually produced freely.

We are indebted for the drawing of this fine plant to Mr. Campbell, curator of the Manchester Botanical Garden, where we saw it flower in very fine perfection amongst many other beautiful and well grown plants.

The generic name is derived from the Greek words *koros,* a dance or merry assembly, and *zema,* drink. Alluding no doubt to the following circumstance: M. Labillardiere, the discoverer of the first species of this genus, travelling in New Holland, he and his party began to suffer from thirst, they had discovered many springs of water, which, on tasting, were found to be salt, but just previous to meeting with the plant which first constituted this genus, they found a good supply of fresh water, and from the pleasure they felt at this unexpected discovery the above name was suggested for this genus. The specific name was given by Mr. Brown, in honour of F. Henchman, Esq.

This species may be purchased at Messrs. Knights', Youngs', Lees', and indeed any of the nurseries around London, also the greater part of the country nurseries, at a moderate price.

DENDROBIUM FIMBRIATUM.

(FRINGED DENDROBIUM.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

Generic Character.—*Lip* spurless, jointed with the column. *Pollen masses* four, parallel.

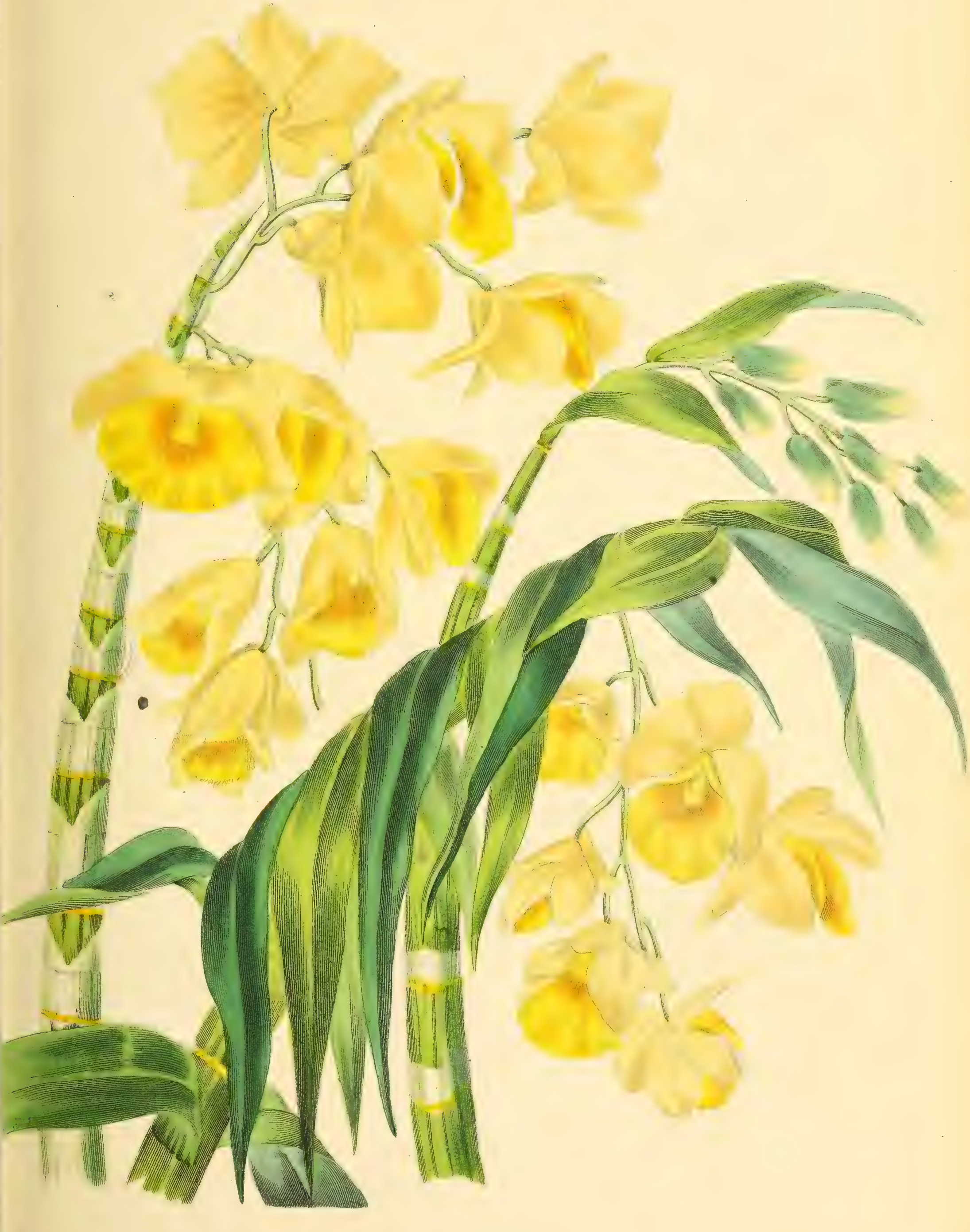
Specific Character.—Epiphyte. *Leaves* lanceolate dark green. *Racemes* many flowered. *Flowers* very splendid and showy. *Sepals and Petals* deep rich orange colour, the latter waved and slightly fringed. *Lip* undivided, hollow, and fringed with an irregularly torn fringe.

This species is a native of Nepal, where it was discovered by Dr. Wallich, and by him introduced to this country in 1823. It is a plant of singular beauty, the rich yellow of the fringed flowers strikingly contrast with the dark green of the leaves and the graceful manner in which the raceme grows, forming altogether a lovely object in the stove, where it requires constantly to be kept.

The best kind of treatment for it is to plant it in well drained pots filled with turfy peat, cut into small squares, and propagated by separating pieces of the stem.

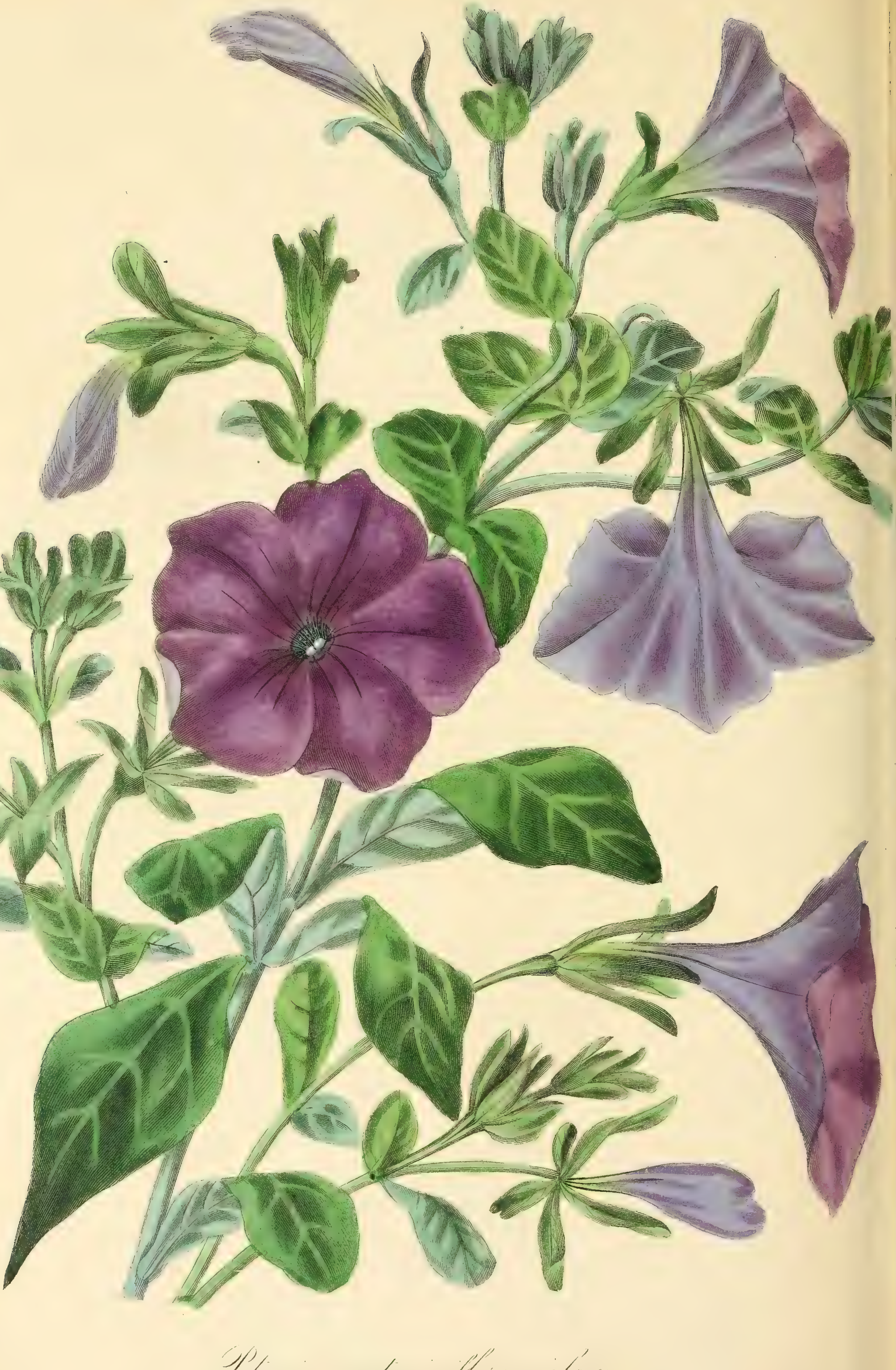
The generic name is derived from two Greek words, *dendron*, a tree, and *bio*, to live, alluding to the habits of the species, which grow and entwine themselves about the branches of trees in the woods of India. The specific name is given from the fringed labellum of the flower.

We are indebted for our drawing to our friend Mr. Campbell, of the Manchester Botanic Garden, where it flowered during the month of June.



Dendrobium fimbriatum.

F.W. Smith sc.



Petunia nyctaginiflora violacea.

F.W. Smith sc

PETUNIA NYCTAGINIFLORA VIOLACEA.

(VIOLET MARVEL OF PERU FLOWERED PETUNIA.)

CLASS. ORDER.
PENTANDRIA. MONOGYNIA.

NATURAL ORDER.
SOLANEÆ.

Generic Character.—See vol. 1, page 7.

Specific Character.—Whole herb dark green, covered with glandular hairs. *Root* fibrous, perennial. *Stems* round, branched, from three to five feet high. *Leaves* ovate, soft, clammy, blunt. *Flowers* large, showy, resembling, for length of tube, those of the Marvel of Peru, fragrant, solitary, stalked, axillary. *Flower stalks* clothed with soft hairs, two inches or more long. *Calyx* deeply parted into five spatulate segments. *Corolla* white, five or six times longer than the *Calyx*, marked with five angles ; tube an inch and a half or two inches long, inside greenish yellow, outside tinged slightly with purple, and thickly clothed with soft hairs ; limb large, spreading about two inches across, with five rounded lobes. *Stamens* five, unequal, inserted in the mouth of the tube. *Pistil* one, longer than the stamens.

Violacea.—*Stems* branching, bluish green, clothed with soft hairs. *Leaves* betwixt ovate and lanceolate, dark green above, lighter beneath ; midrib purple on the under side, the whole leaf covered with soft glandular hairs like the stem. *Calyx* purplish-green, and veined with dark purple. *Corolla* a rich violet purple, intermediate in shape betwixt the *P. nyctaginiflora*, and *P. violacea* ; tube from an inch and a half to two inches long, bellying after the manner of the violacea, outside the tube clothed with soft hairs. *Limb* spreading, with five rounded lobes.

Synonym.—*Nierembergia Atkinsiana.* British Fl. Gard. 268.

This beautiful variety was raised by us at Chatsworth, and, as we have since understood, in several other places about the same time. It was produced by seeds of the *Petunia nyctaginiflora,* which had been impregnated with the pollen of the *P. violacea* (Vol. 1, p. 7).

It is quite hardy, and a very desirable plant, emitting also a delightful fragrance, resembling that of the carnation and pink, as does also the *P. nyctaginiflora.* It is very readily increased by cuttings, and may be treated in every respect like its parents.

Our drawing was made from a plant in the Manchester Botanical Garden, in June last. It may be purchased for a moderate price at almost every nursery around London, and in many other places.

MORE HINTS ON THE MANAGEMENT OF ORCHIDEOUS PLANTS,

WITH A SELECTION OF THOSE WHICH MAY BE CONSIDERED SECOND-RATE, BOTH OF THE EPIPHYTAL AND TERRESTRIAL.

LIST OF SECOND-RATE TERRESTRIAL KINDS.

Aceras anthropophra. *Bot. Cab.* 1775.
——— secundiflora. *Bot Reg.* 1525.
Bartholina pectinata. *Bot. Reg.* Arethusa pectinata.
Calanthe densiflora. *Bot. Reg.* 1646.
Calochilus campestris. *Bot. Mag.* 3187.
Calypso borealis, *Bot. Mag.* 2763. Cypripedium bulbosum, *Lin.* Cymbidium borealis, *Swartz.* Calypso Americana, *Brown.* Limodorum boreale, *Willd.*
Cymbidium xiphiifolium, *Bot. Reg.* 529.
Cypripedium arietinum, *Bot. Cab.* 1240.
——— calceolus, *Bot. Cab.* 363.
Cyrtopodium Andersonii, *Bot. Cab.* 121. *Bot. Mag.* 1800. Cymbidium Andersonii.
——— Woodfordii, *Bot. Reg.* 1508.
Disa bracteata, *Bot. Reg.* 324.
—— prasinata, *Bot. Reg.* 210.
Diuris maculata, *Bot. Mag.* 3156.
Eulophia ensata, *Bot. Reg.* 1147.
——— gracilis, *Bot. Reg.* 742. *Bot. Cab.* 1178.
Epipactis latifolia, *Bot. Cab.* 982.
——— palustris, *Bot. Cab.* 156.
Goodyera discolor, *Bot. Reg.* 271. *Bot. Cab.* 143. Hæmaria discolor.
Geodorum fucatum, *Bot. Reg.* 1687.
Glossula tentaculata, *Bot. Reg.* 862.
Habenaria macroceras, *Bot. Mag.* 2947.
——— blephariglottis, *Bot. Cab.* 925.
——— cordata, *Bot. Mag.* 3164.
——— albida, *Bot. Cab.* 1121.
——— lacera, *Bot. Cab.* 229.
——— orbiculata, *Bot. Cab.* 1623.
——— tridentata, *Bot. Cab.* 1637.
——— bifolia, *Bot. Cab.* 1653.
——— leptoceras, *Bot. Mag.* 2726.
——— Goodyeroides, *Bot. Mag.* 3397.
Malaxis liliifolia, *Bot. Cab.* 198. *Bot. Mag.* 2004. Liparis liliifolia, *Bot. Reg.* 882. Ophrys liliifolia, *Linn.*
Neottia picta, *Bot. Cab.* 214. *Bot. Mag.* 1562. Spiranthes picta, *Lindl.*
——— procera, *Bot. Reg.* 639.
——— australis Chinensis, *Bot. Reg.* 602.
——— bicolor, *Bot. Reg.* 794. Spiranthes bicolor.
——— orchioides, *Bot. Reg.* 701.
——— aphylla, *Bot. Mag.* 2797.

Neottia calcarata, *Bot. Mag.* 3403.
Ophrys alpina, *Bot. Cab.* 1188. Chamorchis alpina.
——— araenifera limbata, *Bot. Reg.* 1197.
——— apifera.
——— fucifera.
——— muscifera.
——— arachnites, *Bot. Mag.* 2516.
Orchis longibracteata, *Bot. Reg.* 357. O. Robertiana.
——— variegata, *Bot. Reg.* 367.
——— tephrosanthos undulatifolia, *Bot. Reg.* 375.
——— longicornu, *Bot. Reg.* 202.
——— fuscescens *Bot. Cab.* 1748.
——— spectabilis, *Bot. Cab.* 78. Habenaria spectabilis.
——— foliosa, *Bot. Reg.* 1701. Habenaria alata, *Hooker.*
Pogonia pendula, *Bot. Reg.* 906.
Ponthieva petiolata, *Bot. Reg.* 760. *Bot. Cab.* 1190.
——— glandulosa, *Bot. Mag.* 842.
Pterostylis Banksii, *Bot. Mag.* 3172.
——— concinna, *Bot. Mag.* 3400.
——— acuminata, *Bot. Mag.* 3401.
——— nutans, *Bot. Mag.* 3085.
——— curta, *Bot. Mag.* 3086.
Pholidota imbricata, *Bot. Cab.* 1934. *Bot. Reg.* 1213.
Satyrium cucullatum, *Bot. Reg.* 416. *Bot. Cab.* 104.
——— coriifolium, *Bot. Reg.* 703.
Sauroglossum elatum, *Bot. Reg.* 1618.
Serapias cordigera longipetala, *Bot. Reg.* 1189.
——— lingua, *Bot. Cab.* 655.
Spiranthes grandiflora, *Bot. Reg.* 1043.
——— cernua, *Bot. Reg.* 823. *Bot. Mag.* 1568. Neottia cernua.

Species requiring the heat of the Stove.

Bartholina pectinata.
Cymbidium xiphiifolium.
Calanthe densiflora.
Calochilus campestris.
Cyrtopodium Andersonii.
——— Woodfordii.
Eulophia ensata.
——— gracilis.
Goodyera discolor.
Geodorum fucatum.
Glossula tentaculata.
Habenaria Goodyeroides.
——— macroceras.
——— longicauda.
Habenaria cordata.
——— leptoceras.
Neottia picta.
——— bicolor.
——— orchioides.
——— aphylla.
——— procera.
——— calcarata.
——— australis Chinensis.
Ponthieva glandulosa.
——— petiolata.
Pholidota imbricata.
Sauroglossum elatum.
Spiranthes grandiflora.

Species requiring the heat of the Greenhouse.

Aceras secundiflora.
Calypso borealis.
Disa bracteata.
——— prasinata.
Diuris maculata.
Pterostylis Banksii.
——— concinna.
Pterostylis acuminata.
——— nutans.
——— curta.
Seraphias lingua.
——— cordigera.
Satyrium cucullatum.
——— coriifolium.

Species merely requiring the Protection of a Frame.

Cypripedium arietinum.
——— calceolus.
Ophrys araenifera limbata.
——— alpina.
Orchis longibracteata.
——— variegata.
——— foliosa.
——— sulphurea.
Orchis coriophora.
——— undulata.
——— acuminata.
——— Rivini.
Pogonia divaricata.
——— pendula.
Spiranthes cernua.

Species that will bear the Open Air.

Aceras anthropophra.
Epipactis latifolia.
——— palustris.
Habenaria blephariglottis.
——— lacera.
——— orbiculata.
——— tridentata.
——— bifolia.
——— albida.
Malaxis liliifolia.
Ophrys apifera.
——— fuscifera.
——— muscifera.
——— arachnites.
Orchis tephrosanthos.
——— longicornu.
——— fuscescens.
——— spectabilis.

Species Flowering in January and February.

Goodyera discolor.
Glossula tentaculata.
Habenaria Goodyeiroides.
Pholidota imbricata.

Flowering in March and April.

Aceras secundiflora.
Cyrtopodium Andersonii.
Cypripedium arietinum.
Calypso borealis.
Diuris maculata.
Disa prasinata.
Habenaria cordata.
Habenaria albida.
Ophrys alpina.
Ponthieva glandulosa.
Pterostylis Banksii.
——— acuminata.
Sauroglossum elatum.

Flowering in May and June.

Aceras anthropophra.
Calochilus campestris.
Disa bracteata.
Eulophia ensata.
——— gracilis.
Epipactis latifolia.
Geodorum fucatum.
Habenaria longicaude.
——— orbiculata.
——— bifolia.
Neottia picta.
——— procera.
——— australis Chinensis.
——— bicolor.
——— aphylla.
——— calcarata.
Ophrys araenifera limbata.
Ophrys apifera.
——— fucifera.
——— muscifera.
——— arachnites.
——— longicornu
——— fuscescens.
——— spectabilis.
——— foliosa.
Orchis longibracteata.
——— variegata.
——— tephrosanthos undulatifolia.
Pterostylis concinna.
Satyrium cucullatum.
——— coriifolium.
Serapias lingua.
——— cordigera longipetala.

Flowering in July and August.

Epipactis palustris.
Habenaria blephariglottis.
———— lacera.
———— tridentata.
Malaxis liliifolia.
Neottia orchioides.
Orchis Rivini.
———— coriophora.
———— sulphurea.
Pogonia pendula.
Ponthieva petiolata.
Spiranthes cernua.

Flowering in September and October.

Bartholina pectinata.
Cymbidium xiphiifolium.
Calanthe densiflora.
Cyrtopodium Woodfordii.
Cypripedium calceolus.
Habenaria macroceras.
Habenaria leptoceras.
Pterostylis nutans.
———— curta.
Spiranthes grandiflora.
Orchis undulata.

LIST OF SECOND-RATE EPIPHYTAL ORCHIDEÆ.

Angræcum micranthus, *Bot. Reg.* 1772.

———— eburneum, *Bot. Reg.* 1522. Limodorum eburneum, *Willd. Sp. Pl.* 4, 125.

———— maculatum, *Bot. Reg.* 618. Æceoclades maculata, *Lindl. Gen. and Spec. Orchid.* 237.

Aporem anceps, *Lindl. Gen. and Sp. Orch.* 71. Dendrobium anceps, *Bot. Reg.* 1239.

Broughtonia sanguinea, *Bot. Mag.* 3076. *Bot. Cab.* 793. Dendrobium sanguineum, *Willd.* Epidendron sanguineum, *Swartz.* Satyrium parasiticum, *Brown.*

Brassavola Perrinii, *Bot. Reg.* 1561.

———— elegans, *Bot. Mag.* 3098.

———— tuberculata, *Bot. Mag.* 2878.

Bolbophyllum Careyanum, *Gen. and Sp. Orch.* 51. Anisopetalum Careyanum, *Hooker.* Pleurothallis purpurea, *Don.* Tribrachia purpurea, *Lindl.*

Catasetum semiapertum, *Bot. Reg.* 1708.

———— purum, *Bot. Mag.* 3388.

———— Hookeri, *Lindl. Gen. and Sp. Orchid.* 156.

Camaridium ochroleucum, *Bot. Reg.* 844. Cymbidium ochroleucum, *Lindl. Gen. Sp. Orchid.* 168.

Cælogyne fimbriata, *Bot. Reg.* 868. *Bot. Cab.* 1425.

Cryptarrhena lunata, *Bot. Reg.* 153.

Cœlia Bauerana, *Lindl. Gen. and Sp. Orchid.* 36. Epidendron tripterum, *Smith.* Cymbidium tripterum, *Swartz.*

Dendrobium macrostachyum, *Lindl. Gen. and Sp. Orch.* 78.

———— secundum, *Bot. Reg.* 1291. Pelidonum secundum, *Blume.*

———— æmulum, *Bot. Mag.* 2906.

———— moniliforme, *Bot. Reg.* 1314. Epidendron moniliforme, *Linn.*

———— polystachyon, *Bot. Cab.* 458. Polystachya luteola, *Hooker.* Epidendron parviflorum, *Pavon.* Cranichis luteola, *Swartz.* Epidendron minutum, *Aubl.* Polystachya Mauritiana, *Spreng.*

———— crispatum, *Swartz.* Epidendron crispatum.

Dicrypta Baueri, *Lindl. Gen. and Sp. Orch.* 152. Heterotaxis crassifolia, *Bot. Reg.* 1028. *Bot. Cab.* 1657.

Eria flava, *Lindl. Gen. and Sp. Orch.* 65. Eria pubescens, *Bot. Reg.* 904. Dendrobium pubescens, *Hooker.* Octomeria flava, *Wallich.* Octomeria pubescens, *Speng.*

Eria rosea, *Lindl.* *Bot. Reg.* 978. *Bot. Cab.* 1817. Octomeria rosea, *Spreng.*
Epidendron nutans, *Bot. Reg.* 17. *Bot. Cab.* 645.
———— fuscatum, *Bot. Reg.* 67. *Bot. Cab.* 472. *Bot. Mag.* 2844. E. anceps, *Jacq.* Amphiglottis lurida, *Salisb.*
———— umbellatum, *Bot. Reg.* 80. *Bot. Cab.* 26. Cirrhopetalum Thouarsii, *Bot. Reg.* 832. Bolbophyllum longiflorum, *Thouars.* Cymbidium umbellatum, *Spreng.*
———— cochleatum, *Bot. Mag.* 572. *Bot. Cab.* 22.
———— ellipticum, *Graham.*
———— crassifolium, *Lindl. Gen. and Sp. Orch.* 107. E. ellipticum, *Lod. Bot. Cab.* 1276.
———— gracile, *Bot. Reg.* 1765.
———— diffusum, *Bot. Cab.* 846.
———— stenopetalon, *Bot. Mag.* 3410.
———— anceps, *Bot. Cab.* 887.
———— pallidiflorum, *Bot. Mag.* 2980.
———— verrucosum, *Bot. Cab.* 1084.
———— polystachyum.
———— virescens, *Bot. Cab.* 1867.
———— patens, *Bot. Cab.* 1537.
———— elongatum, *Bot. Cab.* 986. *Bot. Mag.* 611. Amphiglottis secunda, *Salisb.*
———— fimbriatum, *Gen. and Sp. Orch.* 102.
———— conopseum, *Brown.* Epidendron Magnoliæ.
Fernandesia elegans, *Bot. Cab.* 1214. Lockhartia elegans, *Bot. Mag.* 2715.
Gomeza tenuiflora, *Bot. Cab.* 806. Notylia punctata, *Gen. and Sp. Orch.* 192. Pleurothallis punctata.
Liparis foliosa, *Bot. Cab.* 1097. *Bot. Mag.* 2709. *Bot. Reg.* 882. Cymbidium reflexum, *Brown.*
——— priochilus, *Bot. Cab.* 1751.
——— elata, *Bot. Reg.* 1175. L. bituberculata. *Bot. Reg.* 882.
Limodorum falcatum, *Bot. Mag.* 2097. *Bot. Reg.* 283. Angræcum falcatum, *Lindl.* Æceoclades falcata, *Gen. and Sp. Orch.* 237.
Limodorum maculatum, *Bot. Cab.* 496.
Lepanthes pulchella, *Gen. and Sp. Orch.* 11. Epidendron pulchellum, *Swartz.*
———— tridentata, *Bot. Reg.* 1762. Epidendron tridentatum, *Swartz.*
Maxillaria rufescens, *Lindl.*
———— racemosa, *Bot. Mag.* 2789. *Bot. Cab.* 1318. *Bot. Reg.* 1566.
———— decolor, *Bot. Reg.* 1549.
———— viridis, *Bot. Reg.* 1510. M. placanthera, *Bot. Mag.* 3173.
———— gracilis, *Bot. Cab.* 1837.
———— pallidiflora, *Bot. Mag.* 2806.
———— Parkerii, *Bot. Mag.* 2729.
———— atropurpurea, *Bot. Cab.* 1877. Bifrenaria atropurpurea, *Lindl. Gen. and Sp. Orch.* 152.
———— ochroleuca, *Bot. Cab.* 1904.
———— punctata, *Bot. Cab.* 1914.
———— aromatica, *Graham.* Colax aromaticus, *Spreng.*
———— squalens, *Bot. Mag.* 2955. Dendrobium squalens, *Bot. Reg.* 732. *Bot. Cab.* 1059. Xylobium squalens, *Bot. Reg.* 897.
Microstylis ophioglossoides Mexicana, *Bot. Reg.* 1290. Malaxis ophioglossoides, *Bot. Cab.* 1146.
Megaclinium falcatum, *Bot. Reg.* 989.
Nanodes discolor, *Bot. Reg.* 1541.
Octomeria graminifolia, *Bot. Mag.* 2764. *Bot. Cab.* 1891. Epidendron graminifolium, *Linn.* Dendrobium graminifolium, *Willd.*

Octomeria serratifolia, *Bot. Mag.* 2823.
Oncidium pumilum, *Bot. Reg.* 920. *Bot. Cab.* 1732.
———— ciliatum, *Bot. Reg.* 1660.
———— citrinum, *Bot. Reg.* 1758.
———— cornigerum, *Bot. Reg.* 1542.
———— barbatum, *Gen. and Sp. Orch.* 200.
Ornithidium album, *Bot. Mag.* 3306.
———— coccineum, *Bot. Cab.* 301.
———— parviflora.
Pleurothallis prolifera, *Bot. Reg.* 1298. *Bot. Cab.* 1908. *Bot. Mag.* 3261.
———— racemiflora, *Bot. Cab.* 949. Epidendron racemiflorum, *Swartz.* Dendrobium racemiflorum.
———— saurocephalus, *Bot. Cab.* 1571. *Bot. Mag.* 3030.
———— Lanceana, *Bot. Cab.* 1767.
Polystachya puberula, *Bot. Reg.* 851.
Sophronia cernua, *Bot. Reg.* 1129.
Sarcanthus succisus, *Bot. Reg.* 1014.
Stelis ophioglossoides, *Bot. Reg.* 935. *Bot. Cab.* 442.
—— tubata, *Bot. Cab.* 1061.
—— alba.
Vanda rostrata, *Bot. Cab.* 1008.

The greater part of the kinds in the above lists may be obtained at Messrs. Loddiges', Hackney; Lowe, Clapton; Knight, King's Road, Chelsea; and Rollison, Tooting. I have added the synonyms to all the plants which have more names than one. This will be useful to a purchaser, because it will prevent many mistakes, and much useless anxiety; for, when a plant has three or four names, an admirer of these kind of plants might expend a sum of money in purchasing plants, different in name from any which he possessed, which afterwards, when they flowered, would prove to be the very same he already had under other names.

As many in the list of terrestrial ones are natives of the tropics, and, therefore, require the heat of the stove, whilst others are brought from more temperate regions, and only want the protection of the greenhouse, and others, again, are perfectly hardy, I have separated each kind to themselves; so that at one glance a person may select the kinds they have conveniences for, or wish to purchase.

EPIPHYTES.

Coming into Flower in January and February.

Angræcum micranthum.
Catasetum semiapertum.
Epidendron umbellatum.
———— cochleatum.
———— diffusum.
Fernandesia elegans.
Lepanthes tridentata.
———— pulchella.
Oncidium ciliatum.
Pleurothallis foliosa.

Coming into Flower in March and April.

Epidendron fuscatum.
———— stenopetalum.
———— elongatum.
Megaclinium falcatum.
Octomeria graminifolla.
———— serratifolia.

Coming into Flower in May and June.

Angræcum maculatum.
Broughtonia sanguinea.
Dendrobium polystachya.
Epidendron anceps.
———— pallidiflorum.
Limodorum falcatum.
———— maculatum.
Maxillaria decolor.
———— rufescens.
———— viridis.
Maxillaria pallidiflora.
———— Parkeri.
Oncidium pumilum.
Polystachya puberula.
Pleurothallis racemiflora.
———— Lanceana.
Sarcanthus succisus.
Stelis tubata.
—— ophioglossoides.
Vanda rostrata.

Coming into Flower in July and August.

Catasetum purum.
Camaridium ochroleucum.
Cryptarrhena lunata.
Dicrypta Baueri.
Dendrobium secundum.
———— moniliforme.
Epidendron ellipticum.
———— polystachyum.
Gomeza tenuiflora.
Maxillaria gracilis.
———— atropurpurea.
———— punctata.
———— aromatica.
Microstylis ophioglossoides.
Nanodes discolor.
Oncidium cornigerum.
Ornithidium coccineum.
———— parviflorum.

Coming into Flower in September and October.

Aporum anceps.
Brassavola tuberculata.
———— Perrinii.
Epidendron nutans.
———— patens.
Epidendron conopseum.
———— virescens.
Eria rosea.
Maxillaria racemosa.
———— ochroleuca.

Coming into Flower in November and December.

Cælogyne fimbriata.
Dendrobium æmulum.
Epidendron gracile.
———— verrucosa.
Sophronia cernua.
Liparis foliosa.
Oncidium citrinum.
Ornithidium album.
Pleurothallis prolifera.
———— saurocephalus.

With regard to the times of flowering stated above, much depends on the state of health in which the plant is; the manner it is, or has been treated, and other circumstances; also, many of the species stated above to flower in a particular month may, if healthy, throw up two or three flower-stems at different times in the summer. But the above will show a cultivator, who is anxious to have his plants flower, when he may expect to be gratified.

The following short remarks on the different species will be a guide both as to the kind of flowers each bears, and the peculiarities of culture of each species.

1.—TERRESTRIAL KINDS.

ACERAS.

A. ANTHROPOPHRA. This is a native of the south of Europe as well as of England. The flower-stem grows about a foot high, and produces many flowers.

To prosper, it must be planted in dry situations; and, if in pots, they should be sheltered during winter in a cold frame.

A. SECUNDIFLORA. This is, also, a native of the south of Europe, whence it was introduced a few years ago. The flower-stem grows from six to nine inches high, and produces many small violet-coloured flowers. It has been cultivated successfully, treated in the same way as Cape bulbs.

BARTHOLINA.

B. PECTINATA is a native of the Cape, and should be potted in sandy loam, and kept in the greenhouse. During the season of torpidity it should be kept perfectly dry; and, when beginning to grow, be placed in as light a place as possible. The flower-stem grows about six inches high, and bears one purple flower, with a fringed labellum.

CALANTHE.

C. DENSIFLORA. This was found by Dr. Wallich on the mountains of Sylhet. It, therefore, requires the heat of the stove, and will grow freely in leaf mould and peat, or potted after the same manner as *Epiphytes,* with squares of peat soil The flowers are ochre-coloured.

CALOCHILUS.

C. CAMPESTRIS. This is a beautiful kind, the flower-stem growing about a foot high, and bearing six or eight flowers, the sepals of which are yellowish green, and the labellum purple, covered with rich brown hairs. It is a native of New Holland, where it was found growing on stony hills. It thrives in leaf mould and peat, and should be kept in the stove.

CALYPSO.

C. BOREALIS. A small, but very pretty species. The flower-stem grows about three inches high, and produces a solitary flower, large for the size of the plant. The sepals and petals are a delicate rose colour, and the labellum of a pale reddish brown. It is a native of North America. The soil is leaf mould and peat, and it should be kept in an airy greenhouse.

CYMBIDIUM.

C. XIPHIIFOLIUM. The flower-stem of this grows about nine inches high, and produces from four to six flowers, of an uniform yellowish green colour, without any spotting. These flowers possess a pleasant fragrance, particularly towards evening. It requires the heat of the stove; and will thrive either in leaf-mould and peat well mixed, or peat cut in the same manner as for *Epiphytes.*

CYPRIPEDIUM.

C. ARIETINUM. This is a native of North America. It grows about six or eight inches high, and produces at the top of the stem a single flower, the sepals of which are yellowish green, and the slipper-shaped labellum, white, striped with rose colour. Greater part of the *Cypripediums* thrive best in a mixture of sandy peat, and soil collected from the hearts of rotten trees; but, in the absence of this last, mix with the peat a portion of leaf-mould and rotten saw-dust.

C. calceolus. Native of the North of Europe, and has been found in some parts of England, but is very uncommon. It is very impatient of cultivation, but requires the same kind of treatment as the last. Though perfectly hardy, it is, in a general way, the safest to place this plant in the frame in winter, because the excessive wet often suddenly destroys it.

CYRTOPODIUM.

C. Andersonii. This is a fine species, and ought to have been ranked amongst the first-rate kinds. It is a native of India; and requires, of course, the stove heat. The flower-stem grows about three feet high, and throws out many branches of beautiful fragrant yellow flowers. It grows freely in loam, peat and leaf mould, or in peat alone, potted after the manner of *Epiphytes.*

DISA.

D. bracteata. A native of the Cape of Good Hope. The stem grows to about six or nine inches high, and produces many small yellow-green flowers. It should be potted in peat and leaf mould, and be kept in the greenhouse.

D. prasinata, much handsomer than the last; also a native of the Cape of Good Hope. The flower-stem grows from six to nine inches high, and produces many flowers, of a yellowish green colour, tinged with blotches of crimson. Give this the same treatment as the last.

DIURIS.

D. maculata. Beautiful. The flower-stem grows ten or twelve inches high, producing eight or ten yellow flowers. It is a native of New South Wales, and requires the protection of the greenhouse. Pot in leaf mould and sandy peat.

EULOPHIA.

E. ensata is stated to be a native of Sierra Leone. It must be kept constantly in the stove, and potted in a mixture of leaf mould and sandy peat. The flower-stem grows upwards of a foot high, and produces many middling sized yellow flowers. When in a torpid state, great care must be taken that no water reach the roots, or they soon perish.

E. gracilis. This is also a native of Sierra Leone, where it was collected by Mr. George Don. The flower-stem springs from the root, and grows two or three feet high, producing many yellow-green flowers, which are of considerable continuance. Like the last, this must be kept constantly in the stove, and must be allowed a period of rest in the same way as the *Epiphytes.* The soil may be either a mixture of leaf mould and peat, or peat alone, cut into squares.

EPIPACTIS.

E. latifolia is perfectly hardy, being a native of different parts of Europe. The flower-stem grows about a foot high, and bears many flowers of a dingy green colour. It grows pretty freely in a pot of leaf mould or soil from a hollow tree, but it must be placed in a shady situation, and carefully watered.

E. palustris is a native of this country, but is well worth cultivating. The flower-stem grows about six inches high, and abundance of pretty pink flowers. It grows freely in pots of sandy soil, and is propagated by its roots.

GOODYERA.

G. DISCOLOR. This is a native of Brazil, and requires a good stove heat. The leaves are a very dark green above, and red beneath, whence its specific name. It is a very free flowerer, throwing up many spikes about six inches high. The The flowers are white, and not very showy. The best kind of soil for it is leaf mould and sandy peat.

GEODORUM.

G. FUCATUM. This species I have not yet seen, but class it in the list, from the figure and description given in the *Botanical Register*, 1687. It requires a hot damp stove, and requires to be rested after its leaves have withered.

GLOSSULA.

G. TENTACULATA. A native of China, whence it was brought to this country by Mr. John D. Parks. This is not a plant of much beauty; the flower-stem grows about six inches high, and produces numerous small green flowers. It should be kept in the stove, and be potted in leaf mould and peat.

HABENARIA.

H. MACROCERAS. A curious kind, a native of Jamaica. It requires the stove, and should be potted in leaf mould and peat. The flowers are green, and produced on a stem about nine inches or more high.

H. BLEPHARIGLOTTIS. A native of North America, bearing pure white flowers; is hardy, or nearly so, and should be potted in leaf mould and sandy peat.

H. CORDATA. Flowers small, green, and are said to be fragrant. It requires the greenhouse, and should be potted in leaf mould and sandy peat.

H. ALBIDA. This species is a native of the south of Europe, and is perfectly hardy. The best soil for it is sandy peat and leaf mould. Its flowers are small, of a green colour, and are produced upon a stem from nine inches to a foot high.

H. LACERA. This is a pretty species, growing to a foot or more high; the flowers are yellow, and the petals much lacerated and fringed. It is hardy, but should be placed in a shady situation, and be potted in peat and leaf mould.

H. ORBICULATA. This is another handsome species from North America, which will probably grow in leaf mould and peat. It is perfectly hardy.

H. TRIDENTATA. A species with small green flowers, native of North America. It is hardy, or nearly so; but might be placed in a frame in winter, and be shaded a little from the sun in its summer situation.

H. BIFOLIA. The flowers of this kind are also green, but much larger than those of the last. It should be potted in leaf mould and peat, and stand in a shady place out of doors.

H. LEPTOCERAS requires the heat of the stove, and should be potted in leaf mould and peat. The flowers are green, and grow on a stem a foot and a half high.

H. GOODYEROIDES. Another stove species, with small white flowers, requiring the same treatment as the last.

MALAXIS.

M. liliifolia. A native of North America, perfectly hardy, and well deserving to be cultivated. It should be planted in a mixture of leaf mould and peat, and be placed in a shady situation.

NEOTTIA.

N. picta. All the Neottias require the heat of the stove. This species is a native of Trinidad, and grows freely in pots of leaf mould and peat. The flowers are green.

N. procera bears pale green flowers. It is a native of Nepal, and requires the heat of the stove.

N. australis Chinensis, *bicolor, orchioides, aphylla,* and *calcarata,* all require the stove, and should be potted in leaf mould and peat, and must be kept perfectly dry while in a state of torpidity.

OPHRYS.

O. alpina, *araenifera, apifera, fucifera, muscifera,* and *arachnites,* are all hardy, very curious, and elegant in growth, and require to be planted in leaf mould and peat. The two former, however, require a slight shelter in winter.

ORCHIS.

O. longibracteata, *variegata, foliosa, sulphurea, coriophora, undulata, acuminata,* and *Rivini,* should be potted in light loam and peat. They will bear this climate pretty well; but it is always the safest to shelter them during winter from the rain and frost, in a frame. The *O. longicornu, tephrosanthos, fuscescens,* and *spectabilis,* are usually kept in the open air altogether.

POGONIA.

P. pendula. The flowers of this kind are pink and white. The plant is very diminutive, is a native of North America, and is perfectly hardy; but is probably safer, in consequence of its small size. Shelter it from excessive rains, &c., in a cold frame. The soil is leaf mould and peat.

PONTHIEVA.

P. petiolata and **glandulosa.** Both these species require the heat of the stove, and should be potted in leaf mould and peat.

PHOLIDOTA.

P. imbricata is a stove kind, of rather easy growth, thriving well in leaf mould and peat.

SATYRIUM.

S. cucullatum and **coriifolium** are both very desirable kinds, having bright orange flowers. They are both natives of the Cape of Good Hope, and require the protection of the greenhouse, and to be potted in sandy peat earth.

SAUROGLOSSUM.

S. elatum. This is a stove plant, requiring precisely the same kind of treatment as the *Neottias.*

SERAPIAS.

S. **CORDIGERA LONGIPETALA** and **LINGUA**, are both very desirable plants. They will grow in a mixture of leaf mould and sand, and should receive the shelter of a cold greenhouse.

SPIRANTHES.

S. **GRANDIFLORA** and **CERNUA** require precisely the same treatment as the *Neottias*. The latter, however, is nearly hardy, requiring only a little shelter in a frame.

BEAUTY AND USE OF IVY.

WHY is it, we may reasonably ask, that every one is pleased with the common ivy? There is a charm about that plant which all feel, but none can tell why. Observe it hanging from the arch of some old bridge, and consider the degree of interest it gives to that object. The bridge itself may be beautifully situated; the stream passing through its arches clear and copious, but still it is the ivy which gives the finish and picturesque effect. Mouldering towers, and castles, and ruined cloisters, interest our feelings in a great degree, more or less, by the circumstance of their being covered or not with ivy. Precipices, which else would exhibit only their naked barren walls, are clothed by it in a rich and beautiful vesture. Old trees, whose trunks it surrounds, assume a great variety of aspect; and, indeed, it is a most important agent in forming the beauty and variety of rural landscape. It is also as useful as it is beautiful; and among its uses I would include the very thing of which I am now speaking, for I have no idea that the forms and colours in nature please the eye by a sort of chance. If I admire the ivy clinging to and surmounting some time-worn tower, and the various tints that diversify the parts of the ruin not hidden by it, I can only refer the pleasure I experience to the natural construction of the human mind, which the Almighty has formed to feel a pleasure in contemplating the external world around it. Who is insensible to the beauties of nature at the rising and setting of the summer's sun? Who can behold the moon-beams reflected from some silent river, lake, or sea, and not feel happy in the sight? Not, I believe, in early life, but when hardened in the ways of men, when the chief good pursued is the accumulation of wealth, the acquisition of power, or the pursuit of pleasure, so called,—then mankind lose a sense of the beauties of nature, but never, perhaps, till then. A love for them is inherent in the mind, and almost always shows itself in youth; and, if cherished at that period by education, would seldom be destroyed, or become in after life as it now so generally is.

The ivy is of vast advantage to the smaller birds, as it affords them shelter in winter, and a retreat for building their nests in spring and summer. It is in fructification in October and November; and the sweet juice which its flowers exude supports an infinity of insects in autumn, while its berries are a store of nutriment for many birds in the early spring.

We may all recollect how often we have seen the ivy in October, and the bloom of the sallow in April, without ever asking ourselves why the one flowered so late and the other so early. This is another example of the want of attention paid to things to which people have been always accustomed. Were a tulip to blow in the open air in November, or a white lily in April, the whole country round would flock to the wonderful sight; but the thousand examples of divine wisdom and arrangement that are daily passing before our eyes, are neglected or despised.

Let us inquire whether the tendency of ivy to climb is a wise provision. If one great use of the plant in the economy of nature be the protection of animals, would the purpose not have been equally answered by an evergreen tree springing at once from the ground, and bearing branches like other trees? No; because the shelter afforded by ivy, growing as it does round trunks, and on walls and arches, is much more perfect and secure than could be obtained, perhaps, in any other way.—*Dr. Drummond.*

KENNEDIA COCCINEA ELEGANS.

When we figured this very beautiful plant, p. 99, we omitted to state the origin of so charming a variety. It was raised from seed of the *Kennedia coccinea,* by Mr. G. H. Bunney, of the Kingsland nursery, in the year 1833, to whom we are indebted for our figure.

The plant grows much stronger than the *K. coccinea,* and is a very abundant flowerer. It may be purchased, at a moderate price, of Mr. Bunney, either at the Kingsland nursery, or at the Bedford conservatories, Covent-garden, London, who has besides many other choice and beautiful plants.

PLAN OF A HOUSE FOR GROWING CROPS OF FRUIT IN CONNECTION WITH ORNAMENTAL PLANTS.

Extracted from a Paper on the subject, read before the Caledonian Horticultural Society, March 5, 1829.

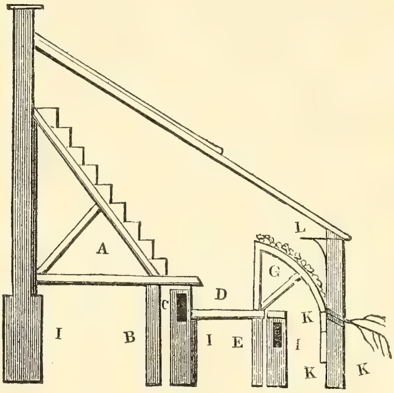
This house is forty feet long, by sixteen wide. It is heated by one furnace, situated at the east end. The first course of heat is carried immediately under the pavement to the front flue, by ascending into which it rises one foot in the angle, two feet from the front, and the same from the end walls.

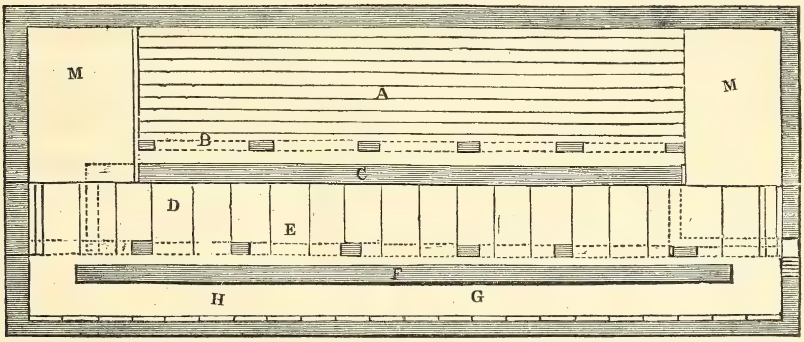
It is carried along this flue thirty six feet, descends under the pavement at the west end, and again rises two feet perpendicularly into the back flue, five feet from the end wall, and four from the front flue. This part of the flue is thirty feet long, and descends in like manner under the pavement at the east end, through which it passes into the chimney situated immediately over the furnace. It thus makes a circuit of one hundred feet, chiefly round the front half of the house.

By this arrangement of the flues, the house is more easily heated, and kept in a more regular temperature, than by the ordinary methods.

The stage occupies a space thirty feet by eight, leaving a space of five feet at each end, which, by a partition of ornamental lattice-work, the full height of the glass and width of the stage, forms these spaces at each end into two very neat lobbies. These are appropriated to the growth of the fine sorts of climbing plants; and the stage is capable of containing from 800 to 1000 plants in pots.

A	Stage for plants.
B	Arched wall for support of stage.
C	Arched wall and back flue.
D	Raised walk or gangway in front of stage.
E	Arched wall for support of walk.
F	Arched wall and front flue.
G	Peach trellis.
H	Stone for support of peach trellis.
I	Made border for vines.
K	Peach border.
L	Front Shelf, for Cape bulbs, &c.
M	Lobbies at each end of the house.





A shelf, eight inches wide, is erected immediately under the sloping rafters in front, which may be occupied with Cape bulbs, seedlings, and other dwarf plants. When the plants are turned out in May the stage may then be appropriated to dwarf vines in pots, figs, or balsams, and other tender annual plants.

ON THE DISCRIMINATION OF SOILS.

There is no subject which can occupy the attention of the gardener which ought to be considered of greater importance than the due discrimination of soils; and yet there are few that have been treated of so vaguely. The press teems with periodicals, and we have regular and accredited works upon horticultural subjects; nevertheless, let us read what we may, we find little else than indeterminate terms and general directions. The consequence is, that if a regular and practised gardener, or an amateur, attempt to cultivate a plant with which he is wholly unacquainted, he but too frequently finds himself disappointed in the results which he has anticipated. He reads of loams, peat, bog earth, sand, manures, &c., and he follows the directions that are given, but his plants sicken, the leaves, perhaps, turn yellow, and he can obtain no blossoms. He consults the Encyclopædias and scientific catalogues, and compares the recorded periods of bloom, the size of the plants, and their general habit and character with the specimen before him, and perceives nothing in common that can raise his hopes. He makes some alteration, chiefly in the temperature of his climate, the volume of air admitted, and the quantity of water, but his plants do not thrive, and vexation succeeds his pleasurable anticipations; and how pleasurable these are, none can tell but those who are gifted with an ardent love of plants, and feel, too sensitively, that "hope deferred maketh the heart sick."

The cultivator in the immediate vicinity of the metropolis knows, or did know, what the nursery terms loam and bog earth imply. We, among others, are perfectly aware that by the former term was not meant the soil of a garden or field, but that peculiar pale, yellowish, or umber-coloured soil, which nurserymen purchase at sufficiently high terms about the neighbourhood of Hampstead,—a soil which would suit nearly every species and variety of stove or greenhouse exotics, either alone or blended with certain proportions of "bog earth."

Now this loam, as far as our recollection serves us, was soft or unctuous in texture, not gritty, capable of some adhesion of particles, yet so light, that if a portion in a medium moist condition was pressed in the hand, it would become a mass; yet, if suffered to fall from the height of two or three feet upon a hard surface, would crumble and break apart. There are few gardeners, remote from London, who can obtain such a choice material; and if, indeed, any person possess what he believes to be a light and rich loam, he may be disappointed in its application. It is in inquiries concerning the nature of soils, that chemistry can afford an efficient aid; and, therefore, we would recommend every gardener to cultivate it to an extent that may enable him to analyse his loam so far as to be able to determine its chief constituents. To do this, he will require a bottle of good muriatic acid (spirit of salt as it used to be called); another of sulphuric acid, which ought to be diluted with three times its weight of rain water; and a third of solution of potassa; that is, a liquor produced by dissolving one ounce of salt of tartar in two or three ounces of rain water. Two drachms, by weight, of any soil, dried on the stock or hob of a sitting-room grate, and powdered in a mortar, may be tested by adding two drachms of muriatic acid, mixed with an equal quantity of pure water. If any sensible effervescence, or hissing, arise, the earth contains chalk or limestone; and, after standing together for four or five hours, the liquor may be strained through blotting paper, washed till sweet, and then dried in the same heat of the grate. The loss of weight will prove the quantity of chalk naturally existing in the soil. In 120 grains, from five to ten grains may be found; and to that extent it will prove useful, as it tends to add firmness of texture and moderate adhesiveness. Beyond ten grains in the 120, it might not be applicable to many greenhouse and stove exotics.

After the abstraction of the chalk, and of the remaining acid, by the frequent washing with soft water, the soil must be again dried and weighed, and four times its weight of the diluted sulphuric acid added. The whole must then be boiled in a glass vessel for one hour. This boiling can frequently be effected in a short phial of thin glass, or a Florence flask, placed upon the cheek of a common fire-grate, first at a distance from the fire. A small piece of paper should be put under the phial; and, as the liquor becomes hot, the vessel may be safely made to approach the fire till the heat is found sufficient to create ebullition. When that is perceived, the boiling should be maintained for one complete hour.

The sulphuric acid will take up iron from the soil, and also the alumen, or pure clay, which it may contain. The iron would be abstracted without heat; but the act of boiling is required to effect the solution of the alumen.

When the liquid has become cold, the contents of the phial are to be poured upon a paper filter, previously weighed; and every grain remaining in the vessel must be carefully washed out by repeated rinsings with pure water, all the washings being poured into the filter. More water is then to be added till the drainings come away free from acid taste, after which, the filter and its contents are to be dried, first by absorption on a piece of chalk; and, finally, on the grate or other hot surface, till they become completely dry. Being then weighed, and the weight of the paper subtracted, the net product will give the amount of iron and alumen.

A good loam will lose, perhaps, ten grains out of the 110, which we will suppose to have been the weight of the soil submitted to the test of sulphuric acid; and of these four will be iron, and the remaining six alumen, or pure clay. The substance upon the filter may weigh from 94 to 100 grains, or nearly so; it will consist chiefly of siliceous or flinty earth.

The proportions adduced approximate to the results of actual experiments; and we know that the loam so tested was most admirable. Some latitude must be permitted, and soils may contain some few grains, more or less, of iron, chalk, and clay. But as a general rule in analysis it may be stated, first, that in 120 grains of a rich light loam, from 90 to 100 ought to consist of flinty insoluble earth; second, that the soluble portion ought to contain from six to ten grains of clay, and perhaps nearly as much chalk and iron. The latter ingredient varies much in soils of different colour. Those of the greyish brown, or umber tint, appear to be the best, the iron being in that peculiar state of chemical oxidation which is most propitious to the health of plants. If a loam be very deficient in chalk, or the matter of pure clay,—as the well conducted experiments of analysis will demonstrate,—the chemical horticulturist can amend it. Caution and precision, both of which will be attained by practice, will be of course required; but if a soil be found so deficient in clay that 120 grains contain but two grains, discoverable by the test of sulphuric acid, it will be very easy to add three, four, or five grains of clay, dried and reduced to fine powder; or, of pipe clay, two, three, or four grains; the same may be said of chalk. If, on the contrary, a soil be found to consist chiefly of coarse gravelly sand, it will not be difficult to separate a portion of that predominant quality by washing off some of the soil, and adding those fine separable matters to the bulk. Thus one-third of a barrow of harsh soil should be washed in two or three waters; the matters that float, or rather that are not deposited within the period of a second or two of time in water, being poured over the remaining two-thirds, and the whole intermixed as the water of lixiviation dries off. Thus the heavy sharp sand of one-third would be abstracted, and the mass become proportionably meliorated. A young active chemist, alive to the charms of horticulture, could effect wonders with his soils. We, of course, speak of those intended for pot cultures, wherein a barrow, with the aid of vegetable soils, &c., goes a great way.

The quantity of vegetable matter which exists in any soil may be pretty accurately determined by burning; that is, by keeping a known weight of it at a red heat, till it retain no blackness upon becoming cold. Vegetable matter is essential to the fertility of a soil; and, therefore, if a loam which is found to contain the staple earths above-mentioned in fair proportion, and is of a good free-working texture, be very deficient in decomposable matters, it must be enriched with leaf mould, decayed vegetable mould, or completely reduced manure.

The best substitute for a perfect natural loam, is the reduced grass turf of a meadow or common. Vegetable matters, it is probable, are resolvable by decay in earth very similar in quality to that upon which they grow; and when short grass turf is cut into thin layers, it will, in a short time, become a fine mould. The turfs, not thicker at first than an inch and a half, should be piled in a heap, the grass face downward, and be kept so for two or three months. They should then be chopped to pieces, turned, and thoroughly incorporated; and these processes are to be repeated, at intervals, till the whole become a mass, replete with tender vegetable fibres. Such a soil, at the end of a year, will prove a valuable substitute for good native loam, and be available for every purpose of the gardener. A stock ought to be prepared every year.

We will now dismiss the consideration of loam, hoping that a certain degree of experience will teach the Horticulturist the real value of chemistry. He, by the aid of a few books, and a little patient assiduity, will acquire a tact; and his pleasure will be much enhanced by the confidence his mind will acquire. None but the ignorant scoff at knowledge; the enlightened mind feels indeed, and is sensible of, its own imperfections; but it possesses *that* which no one can have any conception of but he who has it.

SAND is another substance of the components and qualities of which most are entirely ignorant; as, however, the cultivator of exotics in pots requires only a few sorts of sand to enable him to strike cuttings, and to give openness of texture to his soils and composts, we shall mention but two species; *the first* is that fine, pure, siliceous substance termed *silver or writing sand;* some of this ought always to be at hand; and where pit sand only can be obtained, we recommend that it be washed repeatedly till it cease to yield any considerable quantity of light, earthy matter to water. That clear, heavy substance which precipitates in a second or two, leaving the water void of colour, is sharp enough for the purposes of striking cuttings, and blending with loam and vegetable earth.

The *second sort* of useful sand, is the drift of a road, that has been carried down by rain; this is next in value to river sand, and may be procured readily where that is wholly unobtainable.

In some districts these coarse sands are very compound in their nature; they may contain *lime, alumen*, and iron, but in a state of chemical union which renders them nearly insoluble. In gravelly districts, road and river sand are the reduced, washed fragments of abraded gravel stones; they consist chiefly of flint, coloured with iron. In countries where limestone abounds, the grit contains that substance, and will effervesce with acids.

Both these sands are of great utility, because they give lightness and freedom to the loamy composts that are used in the culture of plants in pots.

HEATH SOIL. This substance is of primary importance; it is the earth which is found at the surface of commons or wastes, where heaths grow naturally. It is the peculiar soil of these plants to which the distinctive title "American" is applied. Thirty years ago the nurserymen in the neighbourhood of London called it by the name of *bog-earth,* and this title, though erroneous, was at least definite and understood; of late years, however, it has been fashionable to adopt the terms *peat* and peat-earth; they are not only indefinite, but utterly vague and inappropriate. Peat, strictly speaking, is the black, decayed vegetable matter dug out of bogs or turbaries; it is to most plants inert and useless; but to a few it affords an aliment of great power; we may mention as examples the *Thunbergia* and *Amaryllides;* not, however, to dwell upon a subject which is now irrelevant, we shall only observe that, by the term *peat,* writers of the day mean to express heath-soil, the bog-earth of the last century; hence we read of sandy peat, turfy peat, black peat, &c. All these terms are applicable only to heath-mould, and they express the varying texture of that material, which certainly admits of much variation in the proportions of its ingredients. The sandy heath soil of Bagshot is of a greyish black tint, it contains a very great proportion of pure white sand, with perhaps scarcely one tenth part of black, decayed vegetable matter. The best heath soil contains much fibrous matter, and is either black or of a brownish hue, which depends upon the peculiar nature of the vegetable matter. All these soils abound with pure white sand, hence their peculiar applicability to plants whose roots are very fibrous, tender, and delicate. Heath mould and loam in different proportions are the staple soils of the gardener, and with them he can effect almost every species of culture.

PEAT, pure peat, or the earth of turf bogs, contains very little sand; it is a heavy, dead, soil, forming, when burnt, a rich manure for inert, cold land; but in most instances it is adverse to the gardener.

We earnestly advise our horticultural readers to desist from the use of the term *peat,* unless they really intend to express the substance dug out of bogs and peat-mosses, and whenever this may be the case, to style it *pure peat.*

When the soil of heaths is understood, we recommend the invariable adoption of the term *heath-mould,* and to qualify it by adding the descriptive words sandy, turfy, or the like, as occasion may dictate.

We shall close our remarks by referring to another vague and unsatisfactory title which is given to an earth of a still more compound nature than any we have hitherto noticed. In descriptive catalogues and horticultural periodicals, we continually meet with the words *rich mould.* Now, we ask, what can any one understand by the terms, for nothing can be more general and indiscriminate. Good garden soil is a rich mould, so is a compost of loam and vegetable, or animal manures. We cannot detect the exact meaning of the writers; but that we may in some degree give to mere empty sounds "a local habitation and a name," we shall venture to describe a soil or compost, which, in our opinion, may merit the name of *rich mould,* and be found suitable to the purposes of the gardener in pot culture. Let one part (say a handful) of pure maiden loam, or the earth of decayed couch, harrowed from a loamy field, be thoroughly blended with equal quantities of the soil from decayed leaves of two years old, and perfectly reduced horse or sheep dung; let these be turned three or four times during the winter months, and they will form an uniform homogeneous mass; the practised gardener will readily render this compost more or less light by the additions of a little more loam, or of pure silver sand.

In our future articles upon the propagation and management of plants, we propose to abide by the opinions which are expressed above, and always to employ those terms that we recommend to others; thus we shall have made the attempt at least to remove difficulties, and to introduce simplicity and uniformity of expression, for nothing tends more directly to confuse and mislead than the adoption of words, which, to say the best of them, convey a doubtful meaning.

July 10, 1835.

OPERATIONS IN THE FLOWER GARDEN FOR SEPTEMBER.

Anemones, now planted in frames, will flower in January and February. Gather the seeds of single ones as they ripen, and sow them immediately either in pans and boxes, or upon beds of light soil. Vol. II. page 19.

Annuals of several kinds now sown in pots, and protected through the winter in a frame, will flower early in the spring. Vol. I. page 20.

Calochortus.—The leaves now having died down, take up the bulbs and treat them after the manner of tulips. Vol. I. page 175.

Chrysanthemums in pots, intended to flower in the greenhouse next November, must be regularly watered with a mixture of soap suds and manure water once or twice a week. And all those that require potting should be attended to in this particular early in this month. Vol. I. page 187.

Gardenia.—Cuttings of the *G. radicans* may be put in towards the end, and those of the *G. florida* which were struck in spring, and have been kept in a hotbed frame, may now be removed to the greenhouse. Vol. I. page 227.

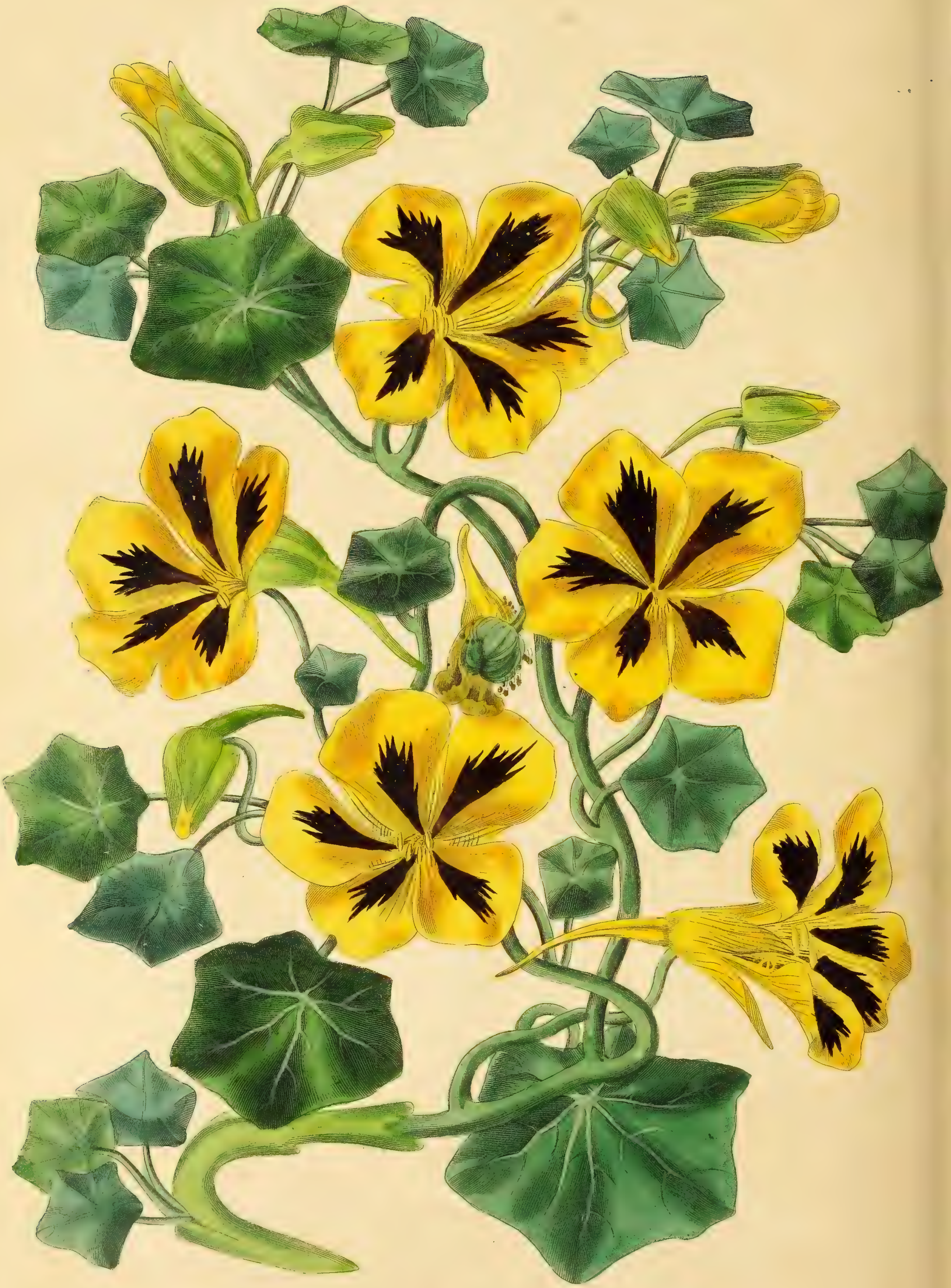
Gladioli.—At the end of the month take up the bulbs of these plants, and replant them in fresh soil. After potting, place them in a cool frame, where they can be sheltered from rains, &c. Vol. I. page 97.

Petunia violacea.—Cuttings of the plant may now be planted in pots to supply the flower borders next spring. These, when struck, must be sheltered in a frame or cold greenhouse. Vol. I. page 7.

Rockets.—May now be propagated by cuttings, as recommended. Vol. I. page 108.

Verbena melindres, and other species, should still be propagated by cuttings, for young plants to furnish the borders next spring. Vol. I. page 173.

Viola tricolor.—Still continue to sow the seeds as soon as gathered. Transplant those previously sown, which are large enough for the purpose. Vol. I. page 116.



F.W. Smith. sc.

Tropæolum majus venustum.

TROPŒOLUM MAJUS VENUSTUM.

(BEAUTIFUL LARGE-FLOWERING NASTURTIUM.)

CLASS.	ORDER.
OCTANDRIA.	MONOGYNIA.

NATURAL ORDER.
TROPŒOLEÆ.

GENERIC CHARACTER.—*Calyx* five-cleft and spurred. *Petals* five, unequal. *Germen* three sided.

SPECIFIC CHARACTER.—Annual. *Leaves* peltate. *Petals* obtuse.

VARIETY VENUSTUM.—*Herb* annual. *Stem* round, smooth, and shining. *Leaves* on long, twisting footstalks; round, with from five to seven broad even angles, glaucous, smooth and shining. *Flowers* large and very showy. *Calyx* greenish orange, striped towards the extremity with red stripes, the spur nearly green at the termination. *Petals* five, nearly equal in size, three lower ones fringed at the base. *Flowers* deep yellow, streaked with bright orange, and having a rich red stripe of an irregular branching shape, extending from the base two-thirds of the way up each petal.

THIS beautiful Nasturtium is a very suitable plant for pot culture, being of a dwarf, and very compact growth, and an exceeding free flowerer. We believe it was introduced last year from Ghent by Mr. Knight, King's Road, Chelsea. The plant is no doubt quite hardy, and is increased by both cuttings and seeds, as recommended for the *T. majus atrosanguinea* in vol. 1, page 176.

We are indebted for our figure to the kindness of our friend Mr. Campbell, curator of the Manchester Botanic Garden.

As there are some curious phenomena connected with this genus we will add:—

SOME OBSERVATIONS ON THE FLASHES OF LIGHT FROM FLOWERS.

BY MR. J. R. TRIMMER, BRENTFORD.

THE power of some plants to emit flashes of light is a subject so curious as to be deserving of more investigation than has at present been bestowed upon it. It is thus described in a note in Darwin's Botanic Garden, vol. 2, page 144: "Miss E. C. Linnæus first observed the *Tropœolum Majus*, or Garden Nasturtium, emit sparks or flashes in the mornings before sun-rise, during the months of June or July, and also during the twilight in the evening, but not after total darkness came on; these singular scintillations were shown to her father and other philosophers, and Mr. Wilcke, a celebrated electrician, believed them to be electric. *Vide Lin. Spec. Plantar.* 490; *Swedish Acts for the Year* 1762; *Pulteney's View of Linnæus*, page 220. Nor is this more wonderful than that the electric eel and torpedo should give voluntary shocks of electricity; and in this plant perhaps, as in those animals, it may be a mode of defence, by which it harasses or destroys the night-flying insects which infest it, and probably it may emit the same sparks during the day, which must be then invisible. This curious subject deserves further investigation. The ceasing to shine of this plant after twilight might induce one to conceive that it absorbed and emitted light like the Bolognian Phosphorus, or calcined oyster shell. The light of the evening, at the same distance from noon, is much greater, as I have repeatedly observed, than the light of the morning; this is owing, as I suppose, to the phosphorescent quality of almost all bodies in a greater or less degree, which thus absorb light during the sunshine, and continue to emit it again for some time afterwards, though not in such quantity as to produce apparent scintillations."

On the same subject Darwin has an additional note in the same volume, page 182. "In Sweden a very curious phenomenon has been observed on certain flowers, by M. Haggren, Lecturer on Natural History. One evening he perceived a faint flash of light repeatedly dart from a marigold; surprised at such an uncommon appearance, he resolved to examine it with attention, and to be assured that it was no deception of the eye, he placed a man near him, with orders to make a signal at the moment when he observed the light. They both saw it constantly at the same moment. The light was most brilliant in marigolds of an orange colour, but scarcely visible in pale ones.

"The flash was frequently on the same flower two or three times in quick succession, but more commonly at intervals of several minutes; and when several flowers in the same place emitted their light together, it could be observed at a considerable distance.

"This phenomenon was remarked in the months of July and August, at sunset, and for half an hour after, when the atmosphere was clear; but after a rainy day, or when the air was loaded with vapours, nothing of it was seen.

"The following flowers emitted flashes, more or less vivid, in this order:—1. The marigold (*Calendula officinalis*); 2. Garden Nasturtium (*Tropæolum majus*); 3. Orange Lily (*Lilium bulbiferum*); 4. African Marigold (*Tagetes patula et erecta*). Sometimes it was also observed on the Sun-flowers (*Helianthus annuus*); but bright yellow, or flame colour, seemed in general necessary for the production of this light, for it was never seen on the flowers of any other colour.

"To discover whether some little insects, or phosphoric worms, might not be the cause of it, the flowers were carefully examined, even with a microscope, without any such being found. From the rapidity of the flash, and other circumstances, it might be conjectured that there is something of electricity in this phenomenon. It is well known, that when the pistil of a flower is impregnated, the pollen bursts away by its elasticity, with which electricity may be combined. But M. Haggren, after having observed the flash from the Orange-lily, the anthers of which are a considerable space distant from the petals, found that the light proceeded from the petals only, whence he concludes, that this electric light is caused by the pollen, which in flying off is scattered upon the petals."—*Darwin's Botanic Garden,* vol. ii. page 182.

I am not aware of any other author who has added any new fact to those already mentioned by Darwin.

I have often observed the curious circumstance of the flashing of flowers, without being at all able to ascertain its cause. Sometimes I have been almost led to suppose it to be an optical deception, occasioned by an impression made on the eye by the bright colour of the flowers from which the coruscations seemed to proceed. But at times I have seen the flashes of light so vivid and plain, and extend to so great a distance, that it is impossible for me longer to entertain that opinion; besides, too, I have seen the flashes proceed from pale-coloured and even white flowers, which would not make that impression on the eye. On the whole, I am much inclined to believe it to be electric, particularly from a circumstance which occurred a few years ago. In walking in my garden in the evening, in which was a considerable quantity of the Nasturtium in bloom, not at all thinking of the flashing of plants, I was struck by the very vivid flashes that proceeded from them, the scintillations were the most brilliant that I had ever observed, and at the same time the sky was overcast with a thunder cloud; directed by this circumstance, I have on several occasions looked for the flashes, when in the evening there has appeared electric clouds collecting, and have always found them, at that time, most to abound, and to be most brilliant. My observation, in this respect, seems to differ from that of M. Haggren, who only witnessed plants to flash on clear nights.

All the plants mentioned by M. Haggren I have observed to flash, with the addition of many others. The Nasturtium is that in which I have most frequently seen the most brilliant flashes; the scarlet geranium I have observed as vivid as any flower, but I have seen them in many lighter coloured flowers, though much fainter, and even in white flowers, particularly in the white rose, and a white species of ænothera.

I have troubled you with these particulars, in the hope that yourself, or some of your correspondents, may have some further facts on the subject to communicate, or that at all events some of your readers may be led to make observations and experiments in regard to so interesting a subject.

MAXILLARIA HARRISONIÆ GRANDIFLORA.

(MRS. HARRISON'S LARGE-FLOWERING MAXILLARIA.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

GENERIC CHARACTER.—*Perianthemum* spreading, resupinate. *Labellum* three-lobed in front, jointed with the claw of the column. Column pubescent. *Pollen masses* two, cleft at the back.

SPECIFIC CHARACTER.—An Epiphyte. *Leaves* solitary, lanceolate. *Flower Stem* growing upright, usually shorter than the leaves, and producing two delightfully fragrant flowers. *Sepals* spreading, oblong, acuminate, of a pale cream colour. *Labellum* three lobed, hollow, outside pale yellow, with purple-red veins, middle lobe extended, purple inside, having an elevated ridge of a bright orange colour, reaching from the base to the middle of the lobe; two side lobes, deep rosy purple, veined with a darker colour. *Column* pale yellow.

SYNONYMS.—Dendrobium Harrisoniæ.—*Hooker's Exot. Flor.* 20. Colax Harrisoniæ. *Lindl. Gen. and Sp. Orchid.* 148.

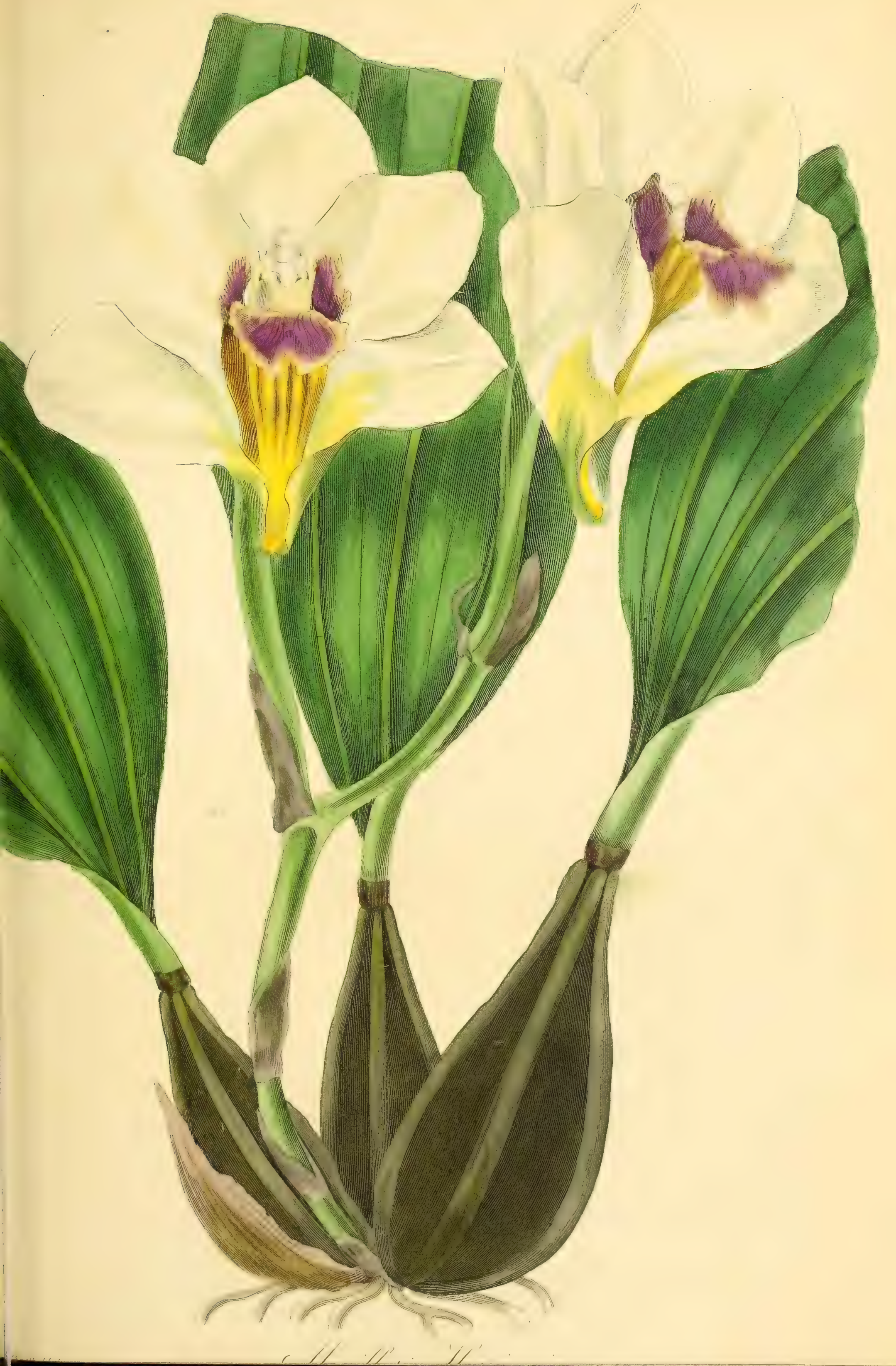
VAR. GRANDIFLORA.—*Plant* stronger and more upright in growth than M. Harrisoniæ. *Flowers* very delicate, emitting a most delicious fragrance, and larger than those of the other species.

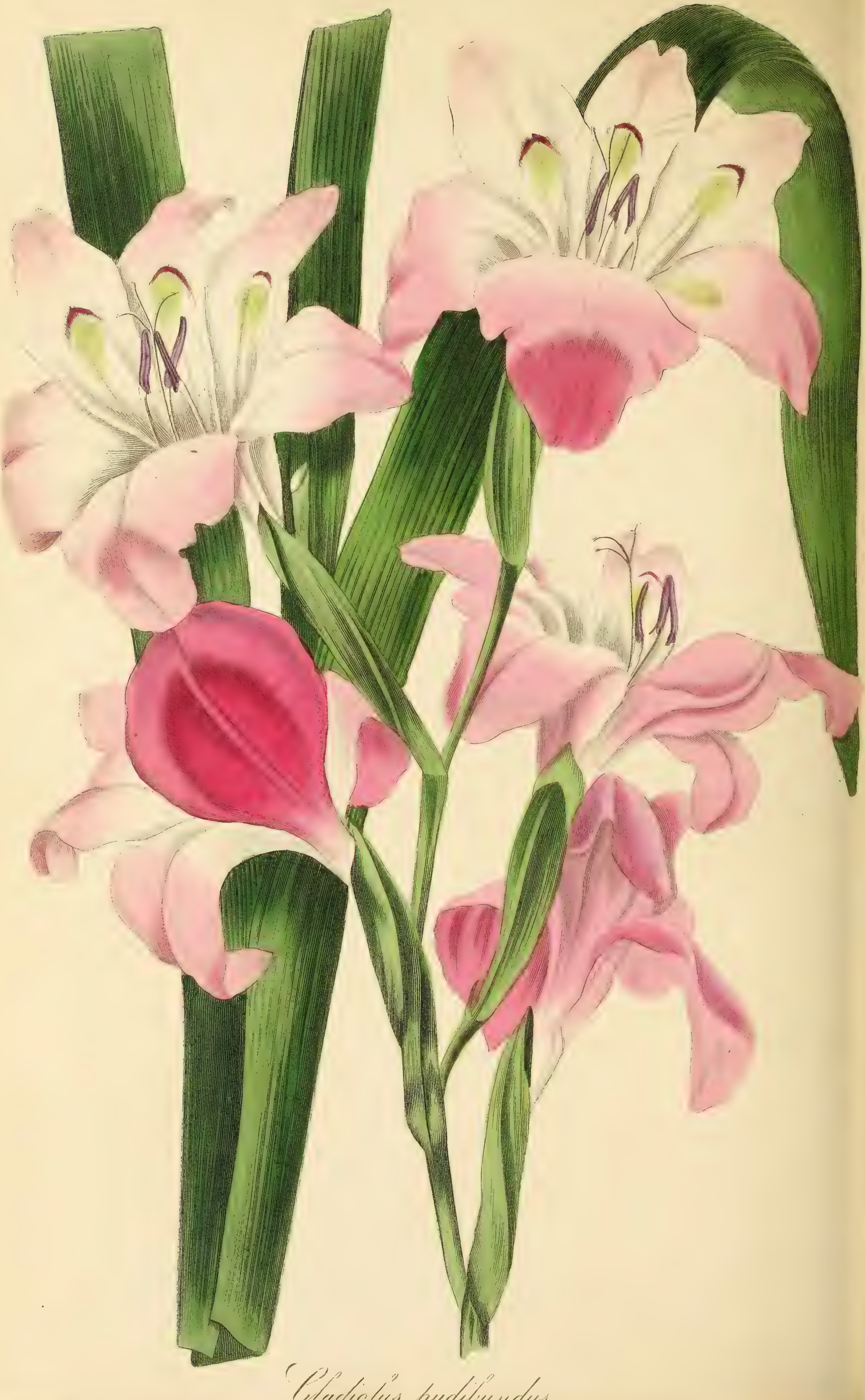
THIS delightful variety surpasses in several respects the species to which it undoubtedly belongs. The fragrance of the flowers perfumes the whole house in which they expand.

The plant requires the constant heat of the stove, and to be potted in pieces of turfy peat, well drained. See page 139 of the present volume.

For the figure of the beautiful Orchideæ I am indebted to the kindness of Richard Harrison, Esq., by whom the plant was introduced some years ago from Rio Janeiro, and in whose extensive and well cultivated collection it was most brilliantly in flower in May last, together with two other very distinct varieties of *M. Harrisoniæ.* The present plant is decidedly the finest of the three, both from the largeness of the flowers and its upright manner of growth.

The generic name is given from the form of the labellum, which, when viewed in a particular position, has the appearance of the maxillæ of some insects.





Gladiolus pudibundus.

GLADIOLUS PUDIBUNDUS.

(BLUSH-FLOWERED CORN-FLAG.)

CLASS.
TRIANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
IRIDEÆ.

GENERIC CHARACTER.—*Spathe* two or three valved. *Corolla* tubular, six parted. *Legume* ovate, lanceolate. *Seeds* winged.

SPECIFIC CHARACTER.—A bulbous plant. *Stem* two feet six inches high. *Leaves* sword-shaped, ribbed, bright green, sharp pointed. *Flowers* a bright and delicate rose colour, twelve or more in number, produced alternate on the stem. *Corolla* divided into six broad segments, three upper ones larger than the lower ones; rich rose colour, becoming more faint towards the base, three lower ones narrow, having in each a pale yellow blotch, with a dark crimson edge; the base of each segment nearly white.

WE understand this is a hybrid, raised by the Honourable and Reverend William Herbert, between the *G. cardinalis*, and *G. blandus.* It is a very beautiful kind, flowering with the greatest freedom, with us at Chatsworth, in the greenhouse, and producing a succession for a long time. It requires precisely the same treatment as *G. cardinalis* and the other species. (Vol. 1, page 98.)

For our present figure we are indebted to Richard Harrison, Esq., of Liverpool, who sent us the spike of flowers, previous to our own plants coming into bloom.

The generic name is given in consequence of the sword-shaped leaves of the plants of this genus.

SCHIZANTHUS PINNATUS HUMILIS.

(DWARF PINNATED SCHIZANTHUS.)

CLASS.	ORDER.
DIANDRIA.	MONOGYNIA.

NATURAL ORDER.
SCROPHULARINÆ.

GENERIC CHARACTER.—Vol. 1, page 5.

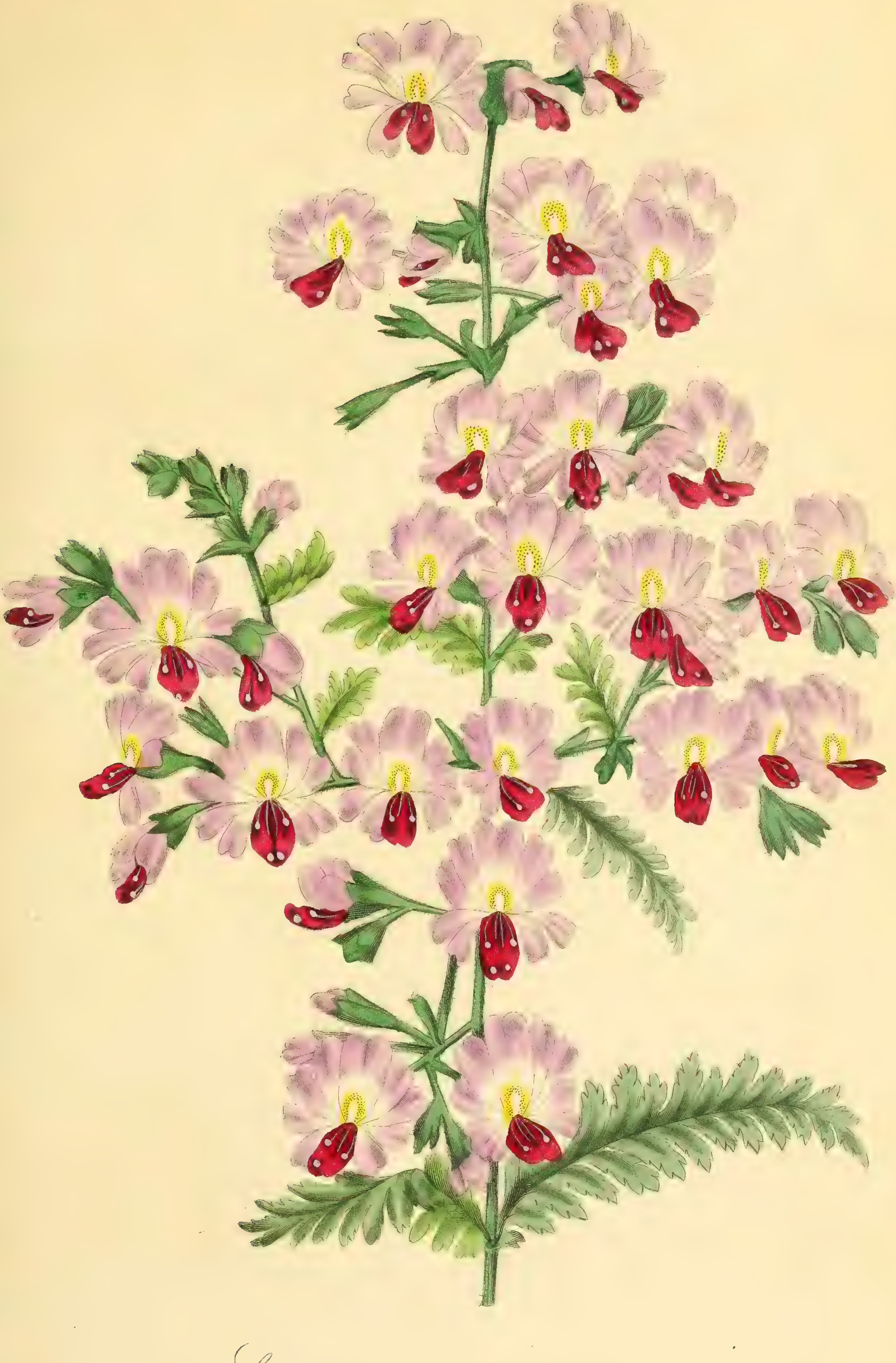
SPECIFIC CHARACTER.—*Root* fibrous, annual. *Stem* much branched, from two to three feet high, round, covered with glandular hairs. *Leaves* alternate, pinnatifid, three inches or more long. *Leaflets* lanceolate, smaller ones entire, larger ones pinnated. *Corolla* of a bluish lilac colour, upper lip tinged with yellow, and spotted with red, lower lip much darker, nearly of a purple colour.

VARIETY HUMILIS.—*Stem* branched, about a foot high, and covered with hairs. *Leaves* pinnatifid, less than those of the species pinnatus. *Leaflets* oblong-lanceolate. *Calyx* in five segments, salver-shaped, covered with glandular hairs like the stem. *Corolla* rich rosy purple.

THIS very pretty variety was introduced by Mr. Hugh Cuming, in 1831, who collected seeds of it in Chili. It flowered, for the first time in this country, in the Garden of the Comte de Vande, Bayswater, under the management of Mr. Campbell, who was gardener there, and to whom we are indebted for our present figure, which was taken at the Manchester Botanical Garden, where the plant flowered beautifully in June last.

It is a hardy annual, of the most easy culture, flourishing in any kind of light soil, and ripening seeds freely. If young plants be raised in August, as recommended (Vol. 1, page 5), and be preserved in a frame or pit, and turned into the borders the following spring, they will make a beautiful show.

We give a figure of this plant, because although it has been in the country now four years, and grows so freely, yet it is by no means common, or so well known as it deserves to be.



Schizanthus pinnatus humilis

F.W. Smith sc.

A FEW REMARKS ON THE CULTURE OF PERENNIALS IN GENERAL,

WITH A SELECTION OF SOME OF THE MOST BEAUTIFUL FOR BOTH THE STOVE, GREENHOUSE, AND OPEN BORDERS.

Perennials are those plants which do not in their growth form either trees or shrubs, but which lose their tops wholly, or in part, every year after they have done flowering; the roots continuing to live and regerminate for several years successively.

Perennials are of two kinds, *bulbous* and *herbaceous*, which, differing materially from each other in habits, require, consequently, a different kind of treatment. Such being the case, it will be necessary to make a few remarks on each kind separately; and

1. BULBOUS PERENNIALS.

These are of three kinds, viz.:—Hardy, or such as will grow in the open border; Greenhouse, or such as require a little protection from cold and wet, but very little heat; and Stove, or those that will not flower or grow to perfection without artificial heat.

Hardy bulbs, with a few exceptions, are remarkably easy of cultivation; and if planted in proper soil and situations, seldom fail to produce plenty of offsets and seeds for propagation.

The best kind of soil for their growth is a light loam, rather sandy than otherwise, yet not too light, or the bulbs will be injured during the heat of summer, and if adhesive they invariably grow weakly and seldom flower.

As to the depth which the different bulbs require to be planted in the ground, no certain rule can be laid down; some species require to be planted not more than an inch and a half deep, and others from four to six inches. This must, therefore, be left to the judgment of the planter.

Encourage as much as possible the growth of the leaves, by giving them free exposure to light and air, for on them depends the success of the bulbs' flowering the following year. If the leaves grow strong, a good quantity of strong pulp is stored up in the bulbs, and a good bloom is the consequence.

Never, if it can be avoided, disturb the roots by removal during the time of their growth; but if obliged to do so, select a wet day, and take them up with good balls, so as to not injure the fibrous roots.

The only time to remove them with success is during the season of their torpidity, at which time the offsets may be separated, and planted where the cultivator may judge best.

The season of rest for most of the spring-flowering bulbs happens shortly after they have done flowering; but the autumn-flowering ones rarely become torpid till towards the following summer; but the only general rule that can be laid down in this is, that when the tops have quite died down then is the time to separate or remove them without injury.

With a few exceptions, as in the case of tulips, and several other florists' flowers, hardy bulbs always do better when not kept long out of the ground after being taken up. Indeed it is always advantageous to plant them again at the same time they are taken up and separated, because *first*, if kept in too dry a place, they are liable to become exhausted, and in some cases to shrivel. *Secondly*, if kept in a damp place they invariably mould, and often perish. *Thirdly*, when left in the ground, they make their roots sooner and much stronger than under other circumstances. *Fourthly*, the season at which they ought to be planted, may prove so busy a time with the gardener, that he may scarcely be able to attend to them, until after they have begun to grow, which in general weakens their flowering, if it does not totally prevent it. And *fifthly*, if planted at the time of separation, all anxiety about them is at an end.

Many of the more tender kinds of bulbs in the borders will require protection from heavy rains, whilst in a torpid state, particularly if the situation be low, flat, or damp; but if planted on banksides, under the walls of hothouses, or other dry situations, this precaution will scarcely be necessary. The readiest and least troublesome way is to place an inverted flower-pot over them, and lay a bit of slate over the draining-hole. The more hardy kinds rarely suffer, and therefore need no particular care.

Greenhouse bulbs. These differ from the last by being usually grown in pots, from the facility with which they can be removed from one place to another, either at the time of flowering or when in a torpid state, and from the different temperature they require.

There are five things indispensable for the successful growth of exotic bulbs, viz.:—suitable soil, a proper temperature, due precaution in watering, perfecting the growth of the leaves, and allowing them a proper season of rest, called wintering.

The soil should be richer than that in which the hardy kinds grow, because from their confinement in pots they are unable to obtain any other nourishment, except what they receive directly from the aid of the cultivator. A light rich loam mixed with very rotten dung, and a portion of peat, perhaps is the best, as a general mixture, for them; but there must be many exceptions to this rule; for some species require nearly all peat, and others flourish best in nearly all loam: and in these exceptions the cultivator must be guided by the native habitats and strength of growth of each species.

Temperature. Those termed greenhouse bulbs require, during their times of flowering, little more than shelter from cold winds and heavy rains; but at the time they first begin to grow, and after they have done flowering, it is always advisable to give them a gentle warmth,—first, to assist them to flower fine, and, lastly, to encourage the leaves to grow fine.

Watering. All the kinds require a good supply of water when in a state of active and vigorous growth; but whilst in a state of torpidity they should be removed to a place where they can remain perfectly dry, until the season of their growth commences again.

Perfecting the leaves. Unless the leaves are perfected properly, no certain success can be anticipated. To encourage their growth, do not place them behind or under the plant stage, as is a common custom; but expose them to a little extra heat, give them plenty of light, and gentle waterings, occasionally with liquid manure: but as soon as the leaves begin to die, lessen the quantity of water, remove the plants to a cooler situation, and eventually leave them dry altogether.

Wintering. During the time of their torpidity, any dry, cold pit or frame will suit them, provided they are not exposed to the effects of frost or water; and as soon as the season is arrived in which they begin to grow, the bulbs should be shook out of the soil, the offsets be separated and repotted in fresh soil, and placed in a gentle heat.

In potting always be careful to drain well, for a stagnation of water usually destroys the bulbs. After potting, as soon as the plants begin to grow, give a gentle supply of water, increasing it as the plants get more strength.

STOVE BULBS require the same kind of treatment as greenhouse bulbs in every respect, except temperature. Being natives of tropical countries, they require the heat of a good stove, and, at the time of their torpidity, placing in a temperature not lower than that of the greenhouse.

HERBACEOUS PERENNIALS.

The mode of cultivating this class of plants is perfectly easy: three things chiefly have to be attended to. *First,* the manner of propagating; *second,* the most suitable soil; and *third,* the requisite temperature.

There are five methods of *propagation* practised: by division, suckers, seed, layers, and cuttings.

Dividing the roots. This may be done either with a knife, if the plant is small, or a spade, if the root is large and strong. The best time for doing it is when the tops are just beginning to grow, after having been cut down.

Suckers. These may be taken up any time when they appear; but the most usual time is when the plant is beginning to grow.

Seed. Sow, for the most part, early in spring in light soil, and plant out the following autumn in the situations where they are to flower.

Layers and Cuttings. Proceed precisely in the same manner as for propagating soft-wooded shrubs and trees.

SOIL. Different species of plants require rather different kinds of soil; but a light rich loam will suit the greater part of plants. Those confined in pots should have the soil enriched with a little very rotten dung.

TEMPERATURE. Plants may be divided into three or four kinds: hardy, frame, greenhouse, and stove. The first require very little care, except keeping free from weeds after once they are planted; but the three last are more trouble, because they grow in pots. They all require similar treatment to each other, with the exception of the heat. The first will bear all weathers without injury; the second require a slight shelter in winter; the third require a little protection during most part of the year; and the fourth will not flourish without a brisk heat.

The following select List is chiefly intended for the use of those persons who have but a limited space, and who are anxious to grow only a few of the most beautiful kinds of plants.

SELECTION OF HARDY PERENNIALS.

Anagallis Webbiana.
Aster spurius.
— paniculatus.
— squamosus.
— pulcherrimus.
— spectabilis.
— Alwartensis.
— humilis.
— versicolor.
Amaryllis belladonna.
Aquilegia Garneriana.
Abronia umbellata.
Calochortus splendens.
— luteus.
— venustus.
— macrocarpus.
Campanula Garganica.
Cineraria aurantiaca.
— lævigata.
Chelone barbata.
— centranthifolia.
Cummingia trimaculata.
Chrysanthemum Indicum.
Cyclobothra pulchella.
— alba.
— lutea.
Delphinium Menziesii.
Dianthus aggregatus.
— barbatus latifolius.
— Libanotis.
Dentaria maxima.
— diphylla.
— trifolia.
— polyphylla.
— endecaphylla.
Diplopappus incanus.
Eschscholtzia Californica.
— crocea.
Eccremocarpus scaber.
Eutoca sericea.
Funkia lancifolia.
Gladiolus cardinalis.
— pudibundus.
— psittacinus.
Geum chiloense.
— grandiflora.
— coccineum.
Gentiana angulosa.
— clavata.
— umbellata.
— utriculosa.
Galardia picta.
Hedysarum consanguineum.
— alpinum.
Hedysarum obscurum.
Hieracium bracteolatum.
— canescens.
— lævigatum.
— longifolium.
Homeria collina.
Hunnemannia fumariæfolia.
Hymenophyllum Wilsoni.
Iris amœna.
— bicolor.
— Nepalensis.
— reticulata.
Jasione perennis.
Lychnis fulgens.
Lupinus polyphyllus.
— — albiflorus.
— mutabilis Cruickshankii.
— littoralis.
— laxiflorus.
— lepidus.
Lophospermum erubescens.
Lobelia cardinalis.
— cœlestis.
— fulgens.
— — propinqua.
— speciosa.
— splendens.
Liatris elegans.
— heterophylla.
— odoratissima.
— pilosa.
— pycnostachya.
— pumila.
— squamosa.
— sphæroidea.
— spicata.
— scariosa.
Linaria Dalmatica.
Linum Sibiricum Lewisii.
Lilium croceum.
— Catesbæi, and most other kinds.
Malva purpurata.
— Monroana.
Milla biflora.
Mimulus rivularis.
— rosea.
— Smithii.
— variegata.
Nemophila insignis.
Œnothera pallidosa.
— speciosa.
— taraxicifolia.
Omphalodes verna.
Onasma rupestre.

Onosma stellulatum.
— tinctoria.
Oxalis Deppei.
Pæonia edulis Reevesiana.
— — Whitleii.
— — Pottsii.
— Moutan albida plena.
— — lacera.
— — punicea.
— — variegata.
— officinalis anemoneflora.
Pardanthus Chinensis.
Pentstemon ovatus.
— speciosa.
— staticifolius.
Phycella ignea pulchra.
Phlox cordata grandiflora.
— corymbosa, and most of the species.
Petunia nyctaginiflora.
— — violacea.
Petunia violacea.
Platycodon grandiflora.
Polemonium humile.
Potentilla Russelianum.
Pyrethrum carneum.
Scilla præcox.
Stachys pubescens.
— germanica pubescens.
Spatalanthus speciosus.
Scutellaria macrantha.
Stratiotes aloides.
Tulipa oculis solis Persica.
— Gesneriana.
Thermopsis fabacea.
Tigridia pavonia.
— conchiflora.
Tritoma Burchellii.
Tritelia laxa.
Vieusseuxia glaucopis.
Verbena melindres.

Species with the colour of the flowers yellow.

Six inches high.
Onosma stellulatum.
— tinctoria.
— rupestre.
Nine inches.
Cineraria aurantiaca.
Cyclobothra pulchella.
— lutea.
Mimulus rivularis.
— Smithii.
One foot.
Cineraria lævigata.
Dentaria endecaphylla.
Eschscholtzia crocea.
— Californica.
Iris bicolor.
Tigridia conchiflora.
Eighteen inches.
Calochortus luteus.
Hieracium bracteolatum.
— longifolium.
Linaria Dalmatica.
Two feet.
Hieracium canescens.
— lævigatum.
Thermopsis fabacea.

Species with the colour of the flowers orange.

One foot high.
Tigridia pavonia.
Two feet.
Galardia bicolor.
— picta.
Gladiolus psittacinus.
Three feet.
Lilium croceum.
— Catesbæi, and most other species.
Four feet.
Pardanthus Chinensis.

Species with the colour of the flowers blue.

Six inches high.
Omphalodes verna.
Anagallis Webbiana.
Gentiana clavata.
Lupinus lepidus.
Polemonium humile.
Scilla præcox.
Nine inches.
Cummingia trimaculata.
Scutellaria macrantha.
One foot.
Aster squamosus.
Eutoca sericea.
Iris Nepalensis.
Jasione perennis.
Lupinus littoralis.
— laxiflorus.
Nemophila insignis.
Eighteen inches.
Aster pulcherrimus.

Two feet.
Aster spectabilis.
Lobelia cœlestis.
Three feet.
Aster spurius.
Aster paniculatus.
Linum Sibiricum Lewisii.
Lupinus polyphyllus.
Pentstemon ovata.
— speciosa.

Species with the colour of the flowers purple.

Six inches high.
Gentiana angulosa.
— utriculosa.
Hedysarum obscurum.
Iris reticulata.
Nine inches.
Gentiana umbellata.
Mimulus variegata.
— rosea.
One foot.
Gentiana Altaica.
Calochortus splendens.
— macrocarpus.
Dentaria polyphylla.
Hedysarum consanguineum.
Liatris pumila.
Eighteen inches.
Aquilegia Garneriana.
Diplopappus incanus.
Liatris pilosa.
Malva purpurata.
Two feet.
Dentaria maxima.
Delphinium Menziesii.
Funkia lancifolia.
Hedysarum alpinum.
Homeria collina.
Iris amœna.
Phlox corymbosa.
— cordata grandiflora.
Lobelia speciosa.
Stachys Germanica pubescens.
Three feet.
Liatris squamosa.
— sphæroidea.
— heterophylla.
— pycnostachya.
— odoratissima.
Four feet.
Liatris scariosa.
— elegans.
Petunia violacea.
— nyctaginiflora violacea.
Six feet.
Liatris spicata.

Flowers of a scarlet and crimson colour.

Three inches.
Oxalis Deppei.
Six inches.
Abronia umbellata.
Spatalanthus speciosus.
Verbena Melindres.
One foot.
Aster Alwartensis.
Dianthus aggregatus.
— barbatus latifolius.
Potentilla Russeliana.
Tulipa oculis solis Persica.
— Gesneriana of all sorts.
Phycella ignea pulchra.
Eighteen inches.
Geum Chilense grandiflora.
Geum coccineum.
Lychnis fulgens.
Silene laciniata.
Two feet.
Chelone barbata.
— centranthifolium.
Gladiolus cardinalis.
Lobelia cardinalis.
— fulgens.
— — propinqua.
— splendens.
Malva Monroana.
Pæonia Moutan lacera.
— — punicea.
— officinalis anemoneflora.
— edulis Reevesiana.

Species with the flowers rose-coloured.

One foot.
Amaryllis Belladonna.
Eighteen inches.
Gladiolus pudibundus.
Pyrethrum carneum.
Three feet.
Pæonia edulis Whitleii.
— Moutan variegata.

Species with the flowers white.

Three inches.

Œnothera taraxacifolia.

Nine inches.

Dianthus Libanotis.
Dentaria diphylla.

One foot.

Œnothera speciosa.
Aster humilis.
Milla biflora.
Dentaria triflora.
Vieusseuxia glaucopis.

Eighteen inches.

Calochortus venustus.

Two feet.

Œnothera pallisada.
Stratiotes aloides.
Pæonia edulis.
— Moutan albida plena.

Three feet.

Aster versicolor.
Pæonia Pottsii.

Four feet.

Lupinus polyphyllus albiflorus.
Petunia nyctaginiflora.

SELECT LIST OF GREENHOUSE PERENNIALS.

Alströmeria aurantiaca.
— bicolor.
— Flos Martinii.
— Neillii.
— ovata.
— oculata.
— pallida.
— psittacina.
— pulchella.
— Pelegrina.
— tricolor.
Amaryllis blanda.
— Forbesii.
— — purpurea.
— Johnsonii, and most other kinds.
Anisanthus Cunoni.
— splendens.
Anomatheca cruenta.
Anthericum glaucum.
Bouvardia triphylla.
Brunsvigia falcata.
Calceolarias of many kinds.
Calostemma alba.
Clivea nobilis.
Coburghia incarnata.
Cyclamen Persicum.
Cypella Herberti.
Cyanella odoratissima.
Cyrtanthus carneus.
— collinus.
— obliquus.
— spiralis.
Cummingia campanulata.
— trimaculata.
Dianella revoluta.
— strumaria.
Gastronema pallidum.
Goodenia gracilis.
Helychrysum herbaceum.
Hunnemannia fumariæfolia.
Ixia curta.
— patens.
— viridiflora, and indeed most others.
Ismene Amancaes.
Lachenalia luteola.
— mutabilis.
Lobelia Tupa.
— Erinus.
— bellidiflorus.
Lychnis grandiflora.
Nerine Sarniensis.
Pancratium Amancaes.
Pelargonium asarifolium.
— dipetalum.
Phycella ignea.
Primula sinensis.
— — alba.
Phyteuma virgata.
Oxalis floribunda.
— rosea.
— versicolor.
— Boweiana.
— pulchella.
— crenata.
Ornithogalum lacteum.
— aureum.
Salpiglossis atropurpurea.
— straminea.
— picta.
Sparaxis lineata.
— grandiflora.
— tricolor.
— orchidiflora.
Spatalanthus speciosus.
Spigelia Marylandica.
Sprekelia formosissima.
Streptanthera cuprea.
— elegans.
Tropæolum tricolorum.
— pentaphyllum.
— majus flore pleno.
Thysanotus isantherus.
— junceus.
— tuberosus.
Velleia paradoxa.
Witsenia corymbosa.
Zephyranthus Atamasco.
— Spofforthiana.

Species with the colour of the flowers yellow.

Six inches high.
Lachenalia mutabilis.
— luteola.
Velleia paradoxa.
Nine inches.
Ornithogalum aureum.
One foot.
Cyrtanthus obliquus.
Ismene Amancaes.
Eighteen inches.
Goodenia gracilis.
Helichrysum herbaceum.
Hunnemannia fumariæfolia.
Two feet.
Calceolarias, several varieties.
Salpiglossis straminea.
— picta.

Species with the colour of the flowers red or scarlet.

Six inches high.
Spatalanthus speciosus.
Nine inches.
Sparaxis tricolor.
Brunsvigia falcata.
One foot.
Anomatheca cruenta.
Bouvardia triphylla.
Cypella Herberti.
Cyanella odoratissima.
Clivea nobilis.
Cyrtanthus spiralis.
— collinus.
Phycella ignea.
Nerine Sarniensis.
Sprekelia formosissima.
Eighteen inches.
Anisanthus Cunoni.
Spigelia Marylandica.
Two feet.
Amaryllis Johnsoni.
Anisanthus splendens.
Three feet.
Alströmeria pulchella.
— psittacina.
Ten feet.
Tropæolum tricolorum.
— pentaphyllum.
Lobelia Tupa.

Species with the colour of the flowers orange.

Six inches.
Ixia curta.
Lychnis grandiflora.
Streptanthera cuprea.
Two feet.
Alströmeria aurantiaca.

Species with the flowers rose-coloured.

One foot.
Coburghia incarnata.
Cyrtanthus carneus.
Gastronema pallida.
Oxalis floribunda.
— rosea.
Primula sinensis.
Zephyranthus Spofforthiana.
Two feet.
Alströmeria pallida.
— tricolor.
— Neillii.
— Pelegrina.
Amaryllis Forbesii.
— blanda.

Species with the colour of the flowers purple.

Six inches high.
Pelargonium asarifolium.
— dipetalum.
Oxalis Boweiana.
Sparaxis grandiflora.
Thysanotus isantherus.
— junceus.
Ixia patens.
One foot.
Thysanotus tuberosus.
Two feet.
Amaryllis Forbesii purpurea.
Salpiglossis atropurpurea.

Species with the colour of the flowers white.

Nine inches.
Oxalis pulchella.
Oxalis versicolor.
Streptanthera elegans.
One foot.
Anthericum glaucum.
Alströmeria flos Martini.
— bicolor.
Calostemma alba.
Ornithogalum lacteum.
Sparaxis lineata.
Zephyranthus Atamasco.

Species with the colour of the flowers blue.

Four inches.
Lobelia Erinus.
— bellidiflora.
Nine inches.
Cummingia campanulata.
— trimaculata.
One foot.
Phyteuma virgata.
Whitsenia corymbosa.
Ixia viridiflora.

SELECT LIST OF STOVE PERENNIALS.

Amaryllis, most kinds.
Alströmerias of several sorts.
Barbacenia purpurea.
Brachystelma crispa.
Canna iridiflora.
Crinum amabile.
— cruentum.
— angustum.
Chlidanthus fragrans.
Dichorizandra thyrsiflora.
Doryanthus excelsa.
Erythrina laurifolia.
— crista galli.
— herbacea.
— poianthes.
Gesneria Cooperi.
— rutila.
— — atrosanguinea.
— tubiflora.
— Suttoni.
— Douglasii.
— bulbosa.
— macrostachya.
Gloxinia maculata.
— caulescens.
— speciosa.
— candida.
Gloriosa superba.
Hibiscus crinitus.
Ipomæa, many species.
Littæa geminiflora.
Hæmanthus multiflorus.
Marica cærulea.
— Sabini.
Pancratium, several sorts.
Pitcairnia staminea.
Portulaca Gilliesii.
Plumbago Capensis.
— rosea.
Russelia juncea.
Strelitzia angusta.
— juncea.
— ovata.
— regina.
Streptocarpus Rexii.

Species with the colour of the flowers yellow.

Six inches high.
Brachystelma crispa.
One foot.
Gesneria Douglassi.
Chlidanthus fragrans.
Three feet.
Strelitzia regina.
Strelitzia angusta.
— ovata.
— juncea.
Hibiscus crinitus.
Twelve feet.
Gloriosa superba.

Species with the colour of the flowers scarlet or crimson.

One foot.
Gesneria Cooperi.
— rutila.
— — atrosanguinea.
— Suttoni.
— tubiflora.
— bulbosa.
— macrostachya.
Hæmanthus multiflorus.
Eighteen inches.
Pitcairnia staminea.
Russelia juncea.
Plumbago rosea.
Canna iridiflora.
Three feet.
Erythrina crista galli.
— laurifolia.
— herbacea.
— poianthes.
Twenty feet.
Doryanthus excelsa.

Species with the colour of the flowers blue.

Four inches.
Streptocarpus Rexii.
Eighteen inches.
Plumbago Capensis.
Three feet.
Marica cœrulea.
Four feet.
Dichorizandra thyrsiflora.

Species with the colour of the flowers purple.

Four inches.
Gloxinia speciosa.
Nine inches.
Gloxinia caulescens.
— maculata.
Portulaca Gilliesii.
Eighteen inches.
Barbacenia purpurea.
Three feet.
Marica Sabini.

Species with the colour of the flowers white.

Four inches.
Gloxinia speciosa alba.
— candida.
Three feet.
Crinum amabile.
Crinum cruentum.
— angustum.
Twenty feet.
Littæa geminiflora.

Besides the above the greater part of the stove species of *Amaryllis, Pancratium, Alströmeria* and *Ipomœa,* deserve a place in any collection.

NEW AND RARE PLANTS FIGURED IN THE PERIODICALS FOR AUGUST.

Botanical Register. Edited by Dr. Lindley. Each number containing eight figures: coloured 4*s*., plain 3*s*., and corresponding letter-press.

Botanical Magazine. Edited by Dr. Hooker. Each number containing eight plates: coloured 3*s*. 6*d*., plain 3*s*., and corresponding letter-press.

British Flower Garden. Edited by Mr. David Don. Containing four plates: coloured 3*s*., plain 2*s*. 3*d*., with corresponding letter-press.

Florists' Magazine. By F. W. Smith. Containing four monthly plates highly coloured: large size 4*s*., small 2*s*. 6*d*.

Of the above twenty-four monthly figures, we have only selected such as are new or very rare; and amongst these only such as deserve to be extensively cultivated. For descriptions and figures reference must be made to the works themselves.

1.—PLANTS WITH TWO COTYLEDONS.

ORDER RANUNCULACEÆ; OR, RANUNCULUS TRIBE.

Pœonia Moutan punicea. Red-flowered tree pœony. This is most probably a seedling from *Anneslei,* as it agrees with that variety in habit, and in the uniform rich colour of its petals. The flowers, however, are larger than in that variety, with the petals more numerous, more deeply cut, and of the colour of carmine. It requires the same culture and treatment as the other varieties from *Papaveraceæ. Brit. Fl. Gard.,* 297.

THE APPLE TRIBE (POMACEÆ).

Cratægus Mexicana. Mexican Hawthorn. This new and very distinct species of hawthorn will form a valuable addition to our hardy shrubs; producing an abundance of white blossoms, which are succeeded by fruit of unusual size, and of the colour of the golden pippin apple. It is a native of the table lands of Mexico, whence it was introduced from seeds received by Mr. Lambert, in 1829. The tree flowered for the first time in the garden at Boynton House, Wilts, in the summer of last year, and ripened its fruit the following November. It is found to be quite hardy, and may be increased by budding on stocks of the common hawthorn. *Brit. Fl. Gard.*, 300.

PROTEA TRIBE (PROTEACEÆ).

HAKEA FERRUGINEA. Rusty-stalked Hakea. This rather handsome and free-growing species has been raised from seeds sent to the Botanic Garden, Edinburgh, under the names of *Hakea elliptica*, and *H. emarginata*. The blossoms are produced in clusters at the axils of the leaves. It flowers very freely in the greenhouse, and probably will thrive upon a south wall. *Bot. Mag.*, 3424.

WHORTLEBERRY TRIBE (VACCINEÆ).

VACCINIUM ALBIFLORUM. White-flowered Whortleberry. This was received at the Glasgow Botanic Garden, from North America: the flowers are a dingy white; and the whole plant very nearly resembles the *Corymbosum*. *Bot. Mag.*, 3428.

VACCINIUM CÆSPITOSUM. Dwarf tufted Whortleberry. This very pretty dwarf species of Whortleberry was introduced to our gardens by Mr. Drummond, from the east side of the Rocky Mountains of North America. The flowers are small, and rose-coloured; and the fruit purple. Both this and the *V. albiflorum* are perfectly hardy, and grow freely upon the American border, in peat soil.

PLANTS WITH COMPOUND FLOWERS (COMPOSITÆ).

LASTHENIA GLABRATA. Smooth Lasthenia. A new hardy annual; a native of California, whence it was introduced by the Horticultural Society, in 1834. It flowers in May and June, if sown very early in spring, or in the previous autumn; and forms a pretty gay mass of yellow in the beds of the flower-garden. It seeds profusely. *Bot. Reg.*, 1780.

DAHLIA—*Duke of Sutherland.* A very beautiful crimson-flowering kind, too well known to need any description; but which is described, and much added on the culture, propagation, impregnation, &c. in the Florists' Magazine, in which the flower is figured beautifully.

THE ROSE TRIBE (ROSACEÆ).

TOURTERELLA ROSE. A shrubby close-growing plant; forms a beautiful head for a standard, sweetly diversified with mellow purple flowers, very double and perfect in their forms.

ROSE CELESTIAL is a looser growing variety, and presents, when grown as a standard, a graceful head of semi-double flowers.

" Syria, Persia, and India, are generally understood as being the native countries of the cultivated or garden rose; and we have this evidence of its being originally an exotic,—that when it ceases to be cultivated it soon disappears; so that though we meet with many other flowers about ruins which have been in a neglected state for centuries, we do not meet with garden roses in such situations. Persia, from the purity of its atmosphere, may be regarded as peculiarly the home of the rose; but there are other places of the world in which it is very extensively cultivated as an article of commerce. The province of Fayoum, in Egypt, on the left bank of the Nile, and bordering on the great desert of Sahara, is one locality of rose culture; and the roses there are chiefly used in the preparation of rose-water. Some of the dry and warm plains in the central regions of the valley of the Ganges, in India, also present fields of roses of an extent of which we have no comprehension, much as we love, and zealously as all classes, from king to cottager, cultivate the rose. In this part of India, roses are employed in the preparation of that exquisite perfume, 'Attar of Roses.'" *Florists' Magazine*, No. 2.

THE CHICKWEED TRIBE (CARYOPHYLLEÆ).

CARNATIONS—*Fletcher's Duke of Devonshire;* and Lascelles' Queen of Sheba. The first is a scarlet bizarre, was raised four or five years ago in the neighbourhood of Birmingham, and is considered, through all the midland counties, one of the best in cultivation: nothing, certainly, can surpass the beauty and elegance of its form, or the vivid hue of its scarlet. It requires no dressing nor extraction of petals; for no flower gives less trouble in blooming: when well bizarred and marked with the clove-coloured stripe, as is mostly the case when well grown, it is fit to compete with any first-rate flower of its class in England. It is a general favourite, and much sought after; and deserves a place in any amateur's collection. It is selling at five shillings the pair.

Lascelles' Queen of Sheba. This fine flower was raised from seed by the Rev. Robert Lascelles, the distinguished chairman of the Cambridge Horticultural Society; it bloomed for the first time three years ago, when it received a premium prize at Cambridge, as being the best seedling then produced: it is highly valued for its rich bright purple, disposed in regular flakes on a clear white ground, and for its excellent form. It has fully maintained its rank three seasons, rating as a first-rate show flower: it has the character also of being a free grower and free bloomer, yielding a fair portion of layers for propagation. It may further be described as resembling, very closely, Princess Charlotte in every essential property, except that its stalk gets up higher, and the flower is something larger: the "grass," or (and) layers are also more diffuse and longer, and less erect than those of the Princess. *Florists' Magazine*, No. 2.

2.—PLANTS WITH ONLY ONE COTYLEDON.

PINE APPLE TRIBE (BROMELIACEÆ).

DYCKIA RARIFLORA. Scattered-flowered Dyckia. Introduced from the Berlin Garden, by the Horticultural Society, in 1833. This plant is a native of the Sierra of Villa Rica, in Brazil; where it and two more species were discovered by the indefatigable travellers Spix and Martius. It flowers in June, and propagates very slowly by offsets, after the manner of an Aloe, with which it agrees in many of its habits. The dry stove seems to suit it; for there it produces its rich orange flowers in great perfection, and retains them in all their freshness and beauty for several weeks. *Bot. Reg.*, 1782.

LILY TRIBE (LILIACEÆ).

Pandora Tulip. This is a new and scarce variety, possessing qualities of the highest order in the estimation of the professional florist. Its cup is finely formed; the petals and sepals are of equal height, of fine texture, and beautiful wax-like substance. The feathering which partially ornaments the flower, is of an intense purple colour, approaching to black; and the flame, which is the chief ornament, is of a beautifully-rich purple, bordered with a darker colour, and finely pencilled into a purely white base. The foliage is long and narrow. When grown, it should be planted in fresh sweet soil, but not enriched by manure, because when the soil is too rich it is apt to "sport," and lose many of its best characters. *Florists' Mag.*, No. 2.

THE ORCHIS TRIBE (ORCHIDEÆ).

MALAXIDEÆ.

Dendrobium cupreum. Copper-coloured Dendrobium. A native of the East Indies, whence it was sent by Dr. Wallich to the Hon. and Rev. W. Herbert, about the year 1825. It flowered at Spofforth for the first time at Midsummer, 1834. Its flowers are of a pale copper-colour, veined with a redder tinge, and have two brown-red blotches inside the lip. *Bot. Reg.*, 1779.

VANDEÆ.

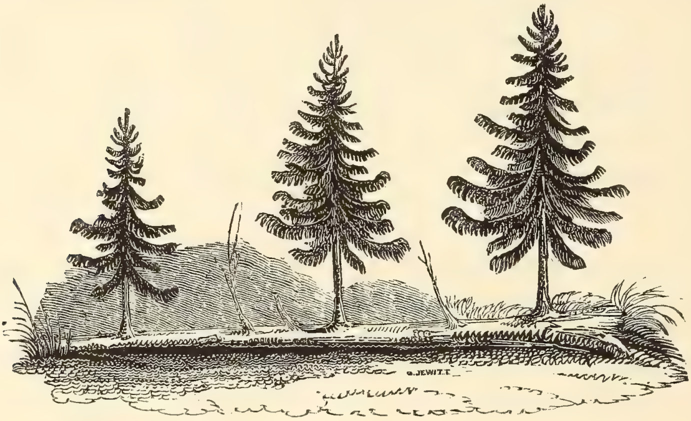
Angræcum distichum. Two-rowed Angræcum. A remarkable neat and pretty-looking species, on account of its small closely-packed deep bright green leaves and tufted stems; but having no beauty of a striking nature in its flowers. It is a native of Sierra Leone, where it is found on the bark of trees; and was introduced by Messrs. Loddiges. It requires a hot damp stove, and to be treated like other epiphytes from the tropics. *Bot. Reg.*, 1781.

OPHRYDEÆ.

Orchis tephrosanthos densifolius. Narrow-lipped Military Orchis; crowded-flowered variety. This extremely handsome orchis has been received at the Glasgow Botanic Garden, from the continent of Europe, under the name of *O. simia*. *Bot. Mag.*, 3426. It is no doubt nearly hardy, probably requiring only shelter in a frame during winter.

A FEW REMARKS ON THE PROPAGATION OF CUNNINGHAMIA AND ARAUCARIA.

A few years ago, Mr. E. Murphy (one of the editors of the *Irish Farmer's and Gardener's Magazine*) communicated to us a short account of a larch tree in one of the woods of Lady Mary Ross, at the "Falls of the Clyde," in Lanarkshire, which was thrown down by some accident. A portion of the roots remaining uninjured, and the situation being moist and shaded, the tree not only continued alive, but pushed up three shoots from the prostrate trunk, each of which has become a handsome tree, differing in no respect from plants raised from seeds.



This specimen Mr. Murphy considered of importance, as affording a perfect illustration of the mode recommended by Mr. Stewart Murray, curator of the Glasgow botanic garden, for obtaining a tree-like stem from cuttings of *Cunninghamia lanceolata;* and which he judged, from analogy, would be found equally applicable to the kindred genera *Araucaria*, *Pinus*, *&c**.

Many plants of these tribes are easily propagated by cuttings or layers ; but the offspring, if left to themselves, never assume any other shape than that of branches. We have, at Chatsworth, a fine plant of *Araucaria excelsa;* which, although nearly twelve feet high, still has the appearance of a long branch, and requires to be trained to a stake to compel it to stand upright. Mr. Murray found that, on bending a branch-like plant of *Cunninghamia lanceolata*, and fastening it on the surface of the ground, a shoot was produced possessing all the characters of the original tree.

Larix possesses the same property ; and if, as there is every reason to believe, *Araucaria excelsa* will succeed, when treated in the same way, this fine plant may soon be much more common than it is at present.

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* Gard. Mag., Vol. II., p. 409.

MINING INSECT ON THE ROSE TREE.

BEING AN EXTRACT FROM THE OBSERVATIONS OF E. W. LEWIS, ESQ.

As inserted in the Entomological Magazine, Vol. I. p. 424.

It has, no doubt, been observed by many, that in autumn the leaves of the rose tree on their upper surfaces are very often marked in various directions with broad brown lines, having a narrow black one running down the middle. This curious appearance is caused by the small caterpillar of a minute moth (*Microsetia ruficapitella*) which feeds inside of the leaf.

When full grown, the caterpillar is nearly two lines long, of a yellow orange colour, with a brown mark down the back, the head very flat and sharp, and light chocolate.

The brown mark on the leaf is caused by the *epidermis* drying, from the insect having eaten the *parenchyma*, or substance of the leaf beneath ; the black one by its *egesta*, which, during its young state, entirely stop up the mine.

When full grown, which is about the 24th of October, it eats out of the leaf, and crawls down the branches and stem, until it has found a convenient place to fix its cocoon. This is the only time when it finds it necessary to make use of its legs, which seldoms exceeds an hour, sometimes less.

After having found a suitable place, which is generally about the spines and offsets of the branches, it begins to form the cocoon, by stretching out its body and attaching a thread to the branch ; it then crosses its body to the other side and there fastens it. By proceeding thus on all sides, keeping the hinder part of the body fixed, it forms the upper part of the cocoon, or that exposed to the weather, which is convex, and generally circular ; the under part is oblong, shaped to hold the pupa, and much smaller than the upper, which projects considerably beyond it on all sides. At one end the threads are not interwoven, and leave a space through which the pupa can force a passage.

This remarkable cocoon is very flat, and at first of a pure white, which is changed by the first shower of rain to light orange ; it afterwards becomes of a deep brown, so nearly resembling the bark of the rose tree as only to be distinguished by a practised eye. This change takes place very rapidly. When kept dry, the cocoon remains perfectly white, and produces the moth at the usual time, as well as those which have been saturated with water.

The pupa is light brown, of an oval shape, about a line long, and half that in breadth, and the perfect moth appears about the 12th of May.

The moth is the red-headed pigmy (*Tinea ruficapitella*, of Haworth). The upper wings are gold coloured, with the apex purple, the head ferruginous, the expansion of the wings 2¾ lines.

LONDON FOGS.

"Fogs," says Mr. Main, "are more dense about London, and probably all other great cities, than elsewhere, because the vast quantity of fuliginous matter floating over such places mingles with the vapour, and renders the whole so thick that a noon-day darkness is sometimes produced, rendering candles and gas-lights necessary for the transaction of the ordinary business of the shops and public offices. Such circumstances happen frequently during winter; but on some occasions (as about two o'clock P.M. on the 27th December, 1831) this foggy darkness was truly awful. This extraordinary appearance is, however, caused by a very ordinary accident, viz. a change of winds, and which may be accounted for as follows: the west wind carries the smoke of the city to the eastward, in a long train, extending to the distance of twenty or thirty miles, as may be seen in a clear day by any person on an eminence five or six miles from the city, and looking across the directions of the wind, say at Harrow-on-the-Hill for instance. In this case, suppose the wind to change suddenly to the east, the great body of smoke will be brought back in an accumulated mass, and as this repasses the city, augmented by the clouds of smoke from every fire therein, it causes the murky darkness alluded to. This effect of the smoke being thrown back on its source may be easily conceived; indeed it may be seen under favourable circumstances, first reverted, and gradually accumulating, till it is dispersed on the opposite side; but wherever the accumulation is, in its progress backward, there will be an unusual degree of darkness. It is to be observed, that the cause of fogs is also the cause of the smoke floating near the earth; of course where there is so much of the latter the former is doubly dense. Besides fogs we have also mists, or haze, usually accompanying east winds, especially in the spring months. In the counties to the westward of the metropolis this is called London smoke; but, as it is seen to the eastward as well as westward of the city at the same time, the appellation is improper. It is observed mostly under a cloudless sun, in consequence of its reflecting the blue rays of light, or perhaps the azure tinge of the sky; hence it is also called a blue mist. So imposing is this in real landscape, that the painter embodies it on the canvas. Aërial perspective cannot well be given without an imitation of this haze, and which constitutes one of the greatest excellences of pictorial execution. Very differently is this appearance estimated by many orchardists; they call it a blight, and consequently deprecate the east wind. It is perfectly true, that tender vegetation suffers under the withering effect of easterly winds, and the hot sun at that season brings forth myriads of aphides and other insects from ova previously laid on the trees; but that they are brought by the east wind is as ridiculous as untrue. The most rational idea we can form of this hazy appearance is, its being caused by the constitutional coldness of the east wind, which, checking the ascent of vapour raised by the sun, carries it horizontally along the lowest stratum of the air, hence its visibility. A lurid gloom is sometimes produced by clouds of snow, when the water floating in the air becomes frozen into spicula, and, congregating into flakes, contrary currents of wind wheel them into irregular masses, which obstruct the light from the sky, so as to wrap every object immediately below in deep yellow light. This circumstance almost always precedes, and is a certain sign of, a fall of snow."—*Mag. Nat. Hist. Vol. V. p.* 304.

DESTRUCTIVE HABITS OF THE ANTLER MOTH.

(CHARÆAS GRAMINIS).

THOUGH the devastations committed by the larvæ of this moth in our island do not appear in general to bear any comparison with its ravages in the Swedish pastures, yet when, from the failure of some of the checks appointed for keeping it within proper bounds, the species is left to increase unmolested, its effects are very apparent.

Some years ago (in 1824, I believe), during the spring and early summer, the herbage of a large portion of the level part of the mountain of Skiddaw, near the well which most tourists visit on the ascent, previous to climbing to the summit of the first *Man,* comprising at least fifty acres, and extending some distance down the western side of the mountain, was observed, even from the town of Keswick, to assume a dry and parched appearance; and so marked was the line, that the progress made by the larvæ down the mountain could be distinctly noted.

Nor was the change of colour of the herbage the only thing that attracted the attention of the good folks at Keswick; large flocks of rooks, attracted no doubt by the abundance of food which these larvæ afforded them, were every morning seen wending their way to the spot, both from the rookeries at Lord's Island and other places in the Vale of Keswick, and also from those of distant ultramontane parts of the neighbourhood, and, after spending the day in preying upon the unfortunate caterpillars, on the approach of night, rising in one dense cloud, dispersing to their respective homes.

Though their numbers must have been in this manner greatly reduced, yet in August the moths literally swarmed throughout the neighbourhood. So completely was vegetation destroyed, that, on a visit to the spot in 1830, the extent of their ravages was distinctly visible, being very similar to the effect produced by the burning of heath, which is so much practised on our hills.—*Entom. Mag.*

BOTANY OF CASTLE EDEN DEAN, IN THE COUNTY OF DURHAM.

CASTLE EDEN DEAN is the largest and most beautiful of a series of romantic dells or deans, which consist, as it were, of immense clefts or chasms in that part of the secondary series of rocks termed the magnesian limestone. Small brooks, locally termed *burns,* run through them; but, from the porous nature of the limestone, the waters seldom reach the sea; and, in Castle Eden Dean, where the stream is larger, and fed by two or three small rivulets, at the distance of perhaps a mile apart, the supply poured down by one disappears, and in one place very suddenly, ere it reaches that part of the main watercourse where the next empties itself. In winter, however, the melting of the snow, and heavy rains, apparently convert the dry bed into a torrent, and, judging from the width of the channel, a large body of water must rush down the valley.

Castle Eden Dean is about four miles long, and averaging nearly a quarter of a mile in width, though in some places the rocks, often a hundred feet perpendicular, reduce its breadth to half that distance. Vegetation is most luxuriant, and its botanical treasures have long rendered it famous in the works on that part of natural history. Suffice it to say, the rare *Cypripedium calceolus* is here, and almost here only, to be met with.

Towards the sea the banks have a more barren appearance, and assume the peculiar marks of the tract of rocks to which the district belongs, producing a great variety of the grasses and other plants delighting in an arid and poor soil. Here the juniper and privet are, by the force of the winds, thrown into those curious flat growths, which must have struck every one who has seen the trees and bushes growing on an exposed sea coast. The banks of the Dean are generally moist, consequent on the density of the foliage and numerous springs in the limestone, but here and there dry exposed grassy spots occur.—*Entomological Magazine.*

OPERATIONS IN THE FLOWER GARDEN FOR OCTOBER.

Anemones, planted in the beginning of this month, will flower about the end of April; and if defended till towards the end of this month they will flower very early in May. Vol. II. page 17, rules 2—6.

Biennials.—Several sorts now ripen their seed, let it be gathered as it ripens, but defer sowing it until spring. The half hardy kinds must be sheltered in a pit or frame towards the end, or if planted in the borders they must be protected either by a handglass or flowerpot from sharp frosts or excessive wet. Vol. I. page 66.

Bulbous Plants.—Some will require wintering, others should be placed in the forcing-house, and several hardy kinds planted towards the end. See page 199.

Gardenia radicans.—Early in the month plant the cuttings; half ripened shoots are the best, cut them off about an inch long, and with a sharp knife take a few leaves off the bottom of each cutting, and cut off the bottom close under a joint. Vol. I. page 226.

Ipomopsis elegans and picta, which were sown last month, will now be ready to pot off into single pots, and must be preserved in a cool, airy place through the winter, where they will require very little water. Vol. I. pages 28 and 245.

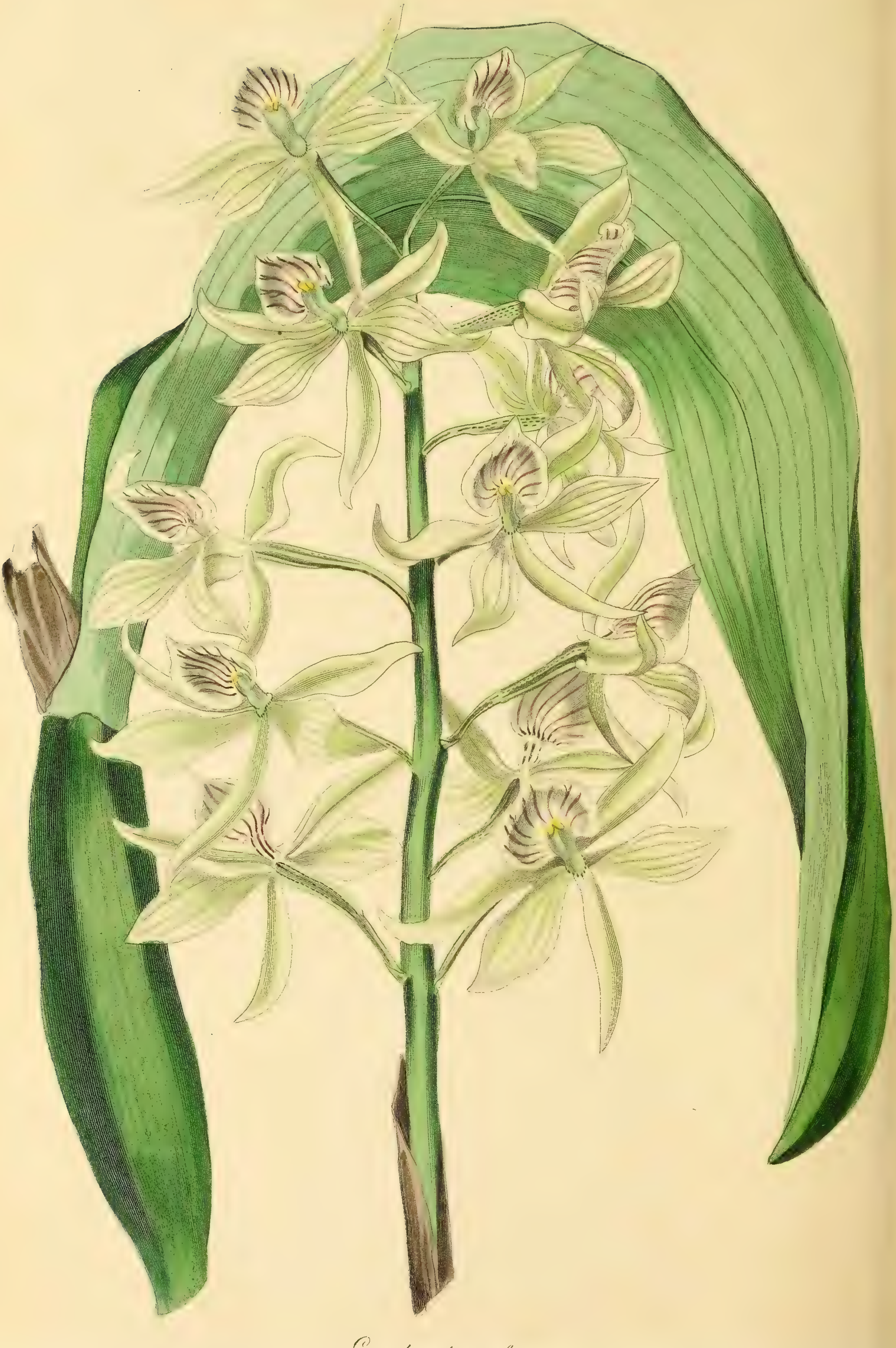
Petunia violacea.—Cuttings put in last month will now require potting off in single pots, to get established before the severity of the winter commences. A dry pit is the best to preserve them in. Vol. I. page 7.

Protection must be afforded to Auriculas, Polyanthus, Carnations, and florists' flowers of most kinds, by placing them in a dry pit or frame.

Pruning.—Evergreens early in the month, for if driven later, the more tender kinds are liable to be injured.

Trees and Shrubs.—This is the best time of the year to remove deciduous trees and some evergreens, but Hollies, &c. are better removed in June.

Verbena Melindres.—Separate all the young branches which have protruded roots, and pot them in small pots, filled with light sandy soil, and place them in a pit or frame to preserve them until the following spring.



F.T. Smith del. et sc.

Epidendron fragrans.

EPIDENDRON FRAGRANS.

(SWEET-SCENTED EPIDENDRON.)

CLASS.	ORDER.
GYNANDRIA.	MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

GENERIC CHARACTER.—*Column* united with the claw of the lip, forming a tube. *Pollen masses* four.

SPECIFIC CHARACTER.—*Plant* epiphyte. *Stem* bulbiform. *Bulbs* oblong, smooth, dark green, each terminated by one or two leaves. *Leaves* lanceolate, obtuse, striated, of a yellowish-green colour, six or eight inches long. *Raceme* terminal, about a span high, many-flowered. *Perianth* three outer pieces, linear-lanceolate, acute, yellow-green; two inner segments obovate-oblong, of the same colour. *Lip* heart-shaped, ending in a sharp point, pale, and striped with purple. *Column* short, of a darker green than the sepals, within yellow.

THIS species is not so remarkable for the beauty of its flowers as for the very delightful fragrance they emit when expanded: we cannot describe this better than to say, that it greatly resembles that of the flowers of hawthorn when first open in spring, only the scent in these is far from being so powerful as that of the Epidendron. The flowers continue without fading for a long time.

The plant is a native of Jamaica, whence, we believe, it was first received in this country by Messrs. Loddiges, of Hackney, through a friend of theirs, of the name of Mr. R. Smith.

The usual time of flowering is October; but it often flowers very finely in April, May, July, and August. The plant from which our drawing was made, is in the possession of the Right Hon. Earl Fitzwilliam, Wentworth House, where it flowered beautifully in May last.

It requires to be constantly kept in the stove, and should be potted as recommended in page 137. Our plants at Chatsworth increase slowly, and do not appear to flourish if often shifted.

The generic name is derived from the Greek words *epi*, upon, and *dendron*, a tree; because in the native woods they are always growing upon the branches of trees, their little roots covering the outside of the bark, or hanging pendent, in order to absorb the exhalations constantly arising from a damp soil and dense underwood. The specific name is given on account of the fragrance of the flowers.

CALCEOLARIA CORYMBOSA, *var.* JUPITER.

(JUPITER CALCEOLARIA, OR SLIPPER-WORT.)

CLASS.	ORDER.
DIANDRIA.	MONOGYNIA.

NATURAL ORDER.

SCROPHULARINEÆ.

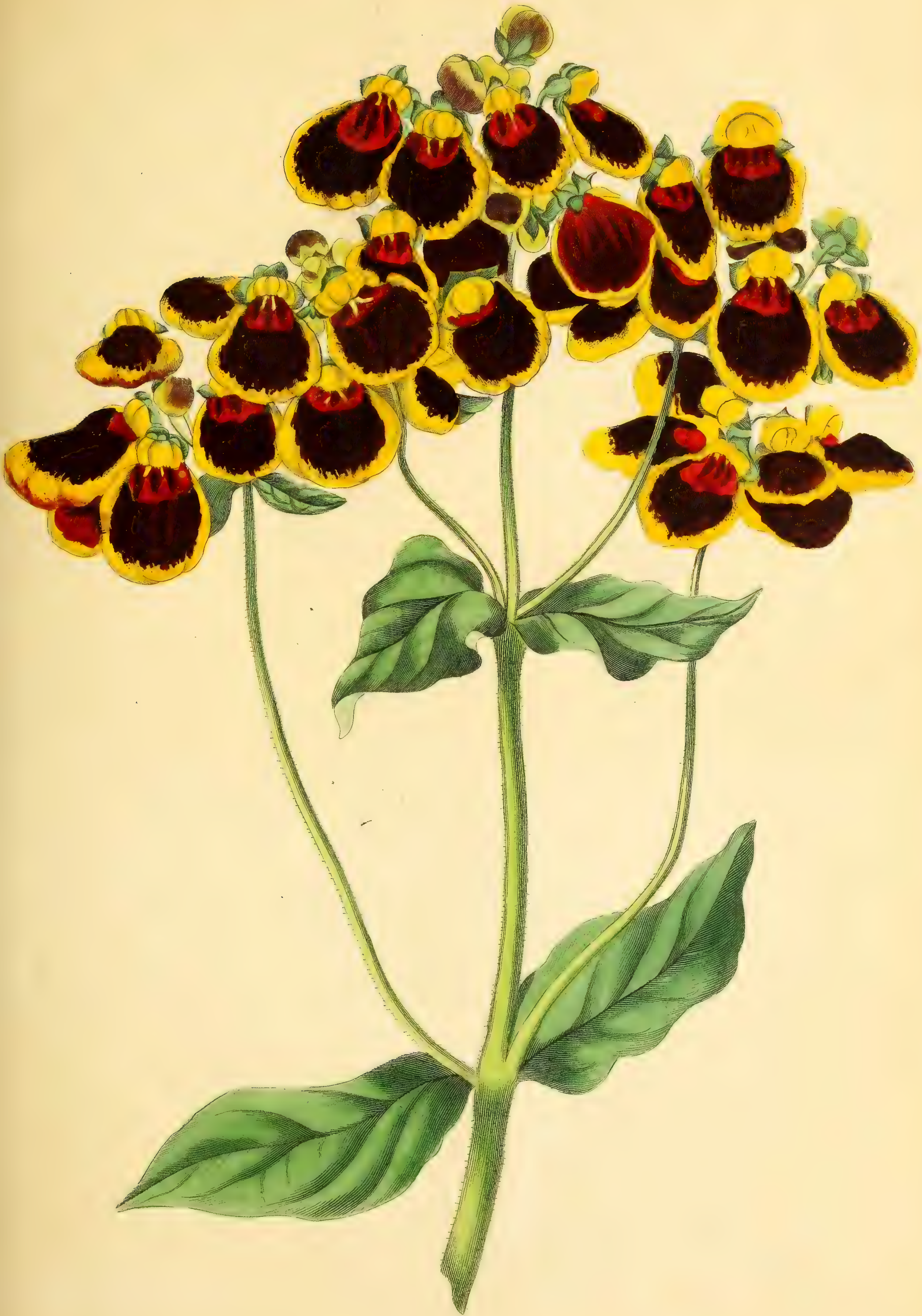
Generic Character.—*Calyx* four-cleft. *Corolla* monopetalous, two-lipped, inflated. *Capsule* two-celled and four-valved.

Specific Character.—*Plant* perennial, herbaceous. *Stems* a foot or more high, erect, simple, covered with soft hairs, of a purple colour. *Lower Leaves* ovate, obtuse, having a short leaf stalk, and notched. *Stem Leaves* heart-shaped, embracing the stem, opposite. *Flowers* in a corymb. *Flower Stems* long and slender, covered also with pubescence like the stem. *Calyx* broadly ovate, spreading, partly acute. *Corolla,* upper lip small, lower one large and inflated, bright yellow. *Germen* globose.

Var. Jupiter.—*Stem* a foot and a half or two feet high, covered with pubescence. *Root Leaves* oblong-lanceolate, obtuse, doubly notched. *Stem Leaves* ovate, obtuse, opposite. *Corymbs* forked, consisting of thirty or forty flowers. *Calyx* ovate, acuminate. *Corolla,* upper lip small, yellow, incurved; lower lip large, of a deep brownish red, with a yellow border, and slightly notched; inside purple at the mouth, and below yellow.

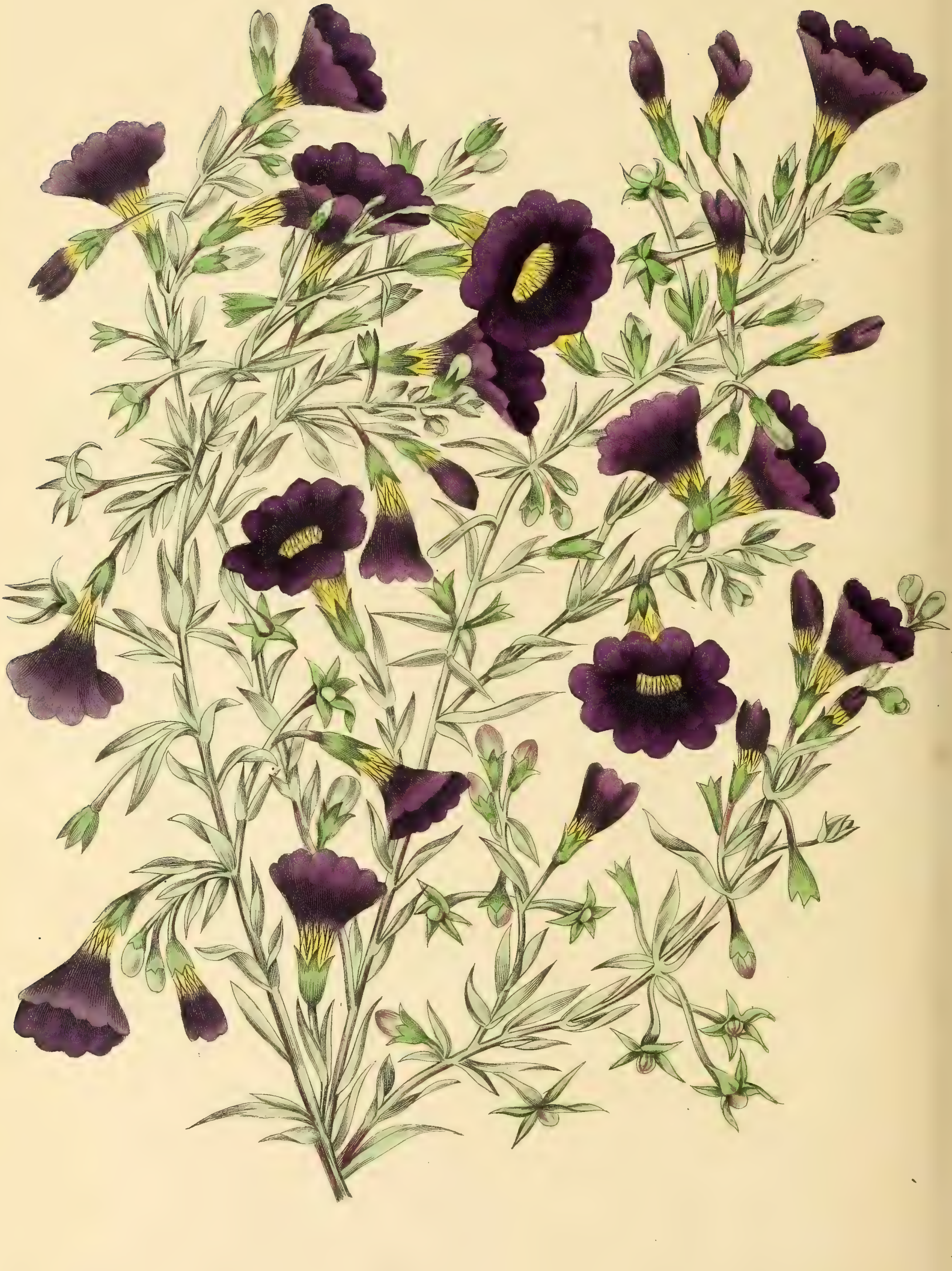
This is one of the many beautiful varieties of Calceolaria raised by Messrs. Young. It is certainly a very splendid kind, and well deserves to be in every collection. It is nearly, if not altogether, hardy. Nevertheless it is best, whatever kinds are grown on borders, to shelter them from excessive wet in winter, if they are not taken up and placed in pots.

For the particulars of successful culture, see Vol. I., page 246.



Jupiter Calceolaria.

F. W. Smith del et sc



Petunia linearis.

F.W. Smith, sc

NOVR 1835

PETUNIA LINEARIS.

(NARROW-LEAVED PETUNIA.)

CLASS. PENTANDRIA. ORDER. MONOGYNIA.

NATURAL ORDER. SOLANEÆ.

Generic Character.—See Vol. I., page 7.

Specific Character.—*Plant* a small shrub, covered thickly with glandular hairs. *Stems* upright, branching, clammy, about a foot high. *Leaves* alternate, oblong, narrow, blunt, about half an inch long, pale green. *Flowers* terminal, or situated opposite the leaves, very copious, and when expanded shining in the sun like crimson velvet. *Calyx* campanulate, five-toothed. *Corolla* funnel-shaped, covered on the outside with soft hairs, hardly an inch long; tube orange, beautifully veined with purple, somewhat longer than the calyx; throat bright orange within; limb five-lobed, of a rich crimson purple, very brilliant in sunshine; the centre, as it approaches the throat, very dark, towards the border lighter, and more tinged with blue. *Stamens* all fertile.

Synonyms.—Salpiglossis linearis, *Hooker in Bot. Mag.* 3256. Nierembergia intermedia, *Graham in Edin. Philos. Jour.*, and *D. Don in British Flower Garden,* 237, New Series. Petunia linearis, *Hon. and Rev. W. Herbert's MS.*

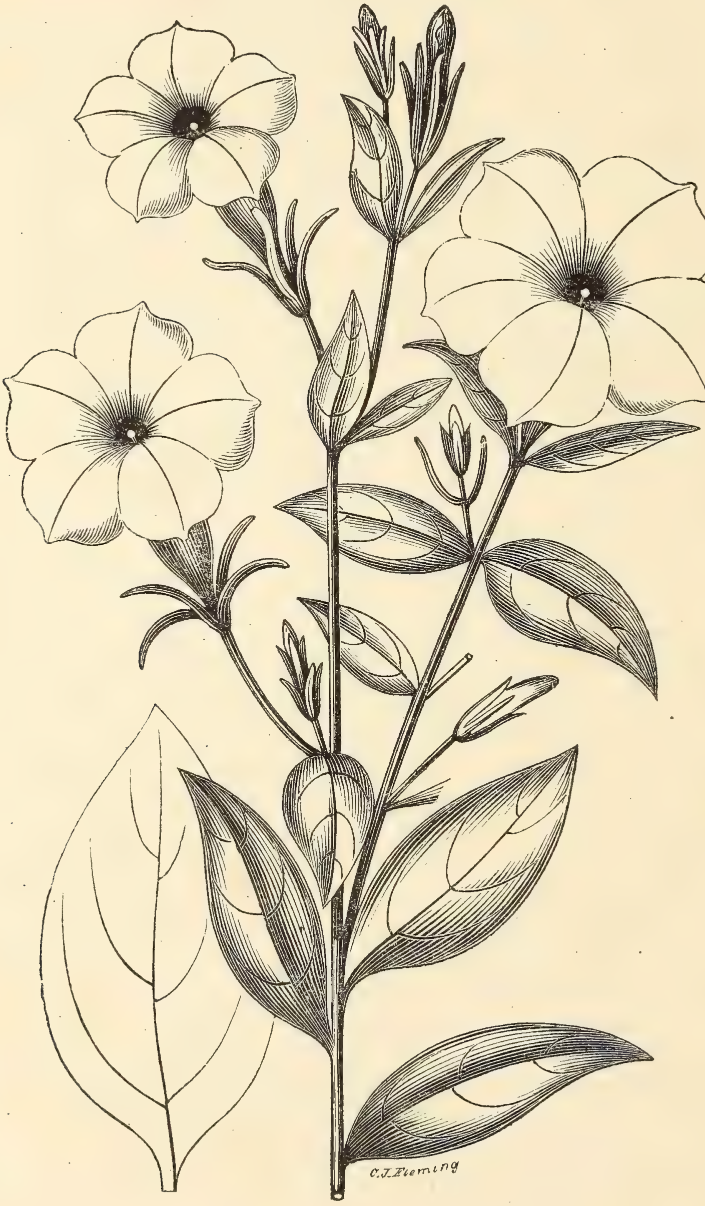
This exceedingly pretty species is a native of Buenos Ayres, where it was discovered growing in sandy plains by Mr. Tweedie, who transmitted seeds of it to Mr. Niell, of Cannonmills, in 1832; from this seed one plant was raised, which flowered in the stove in September 1833.

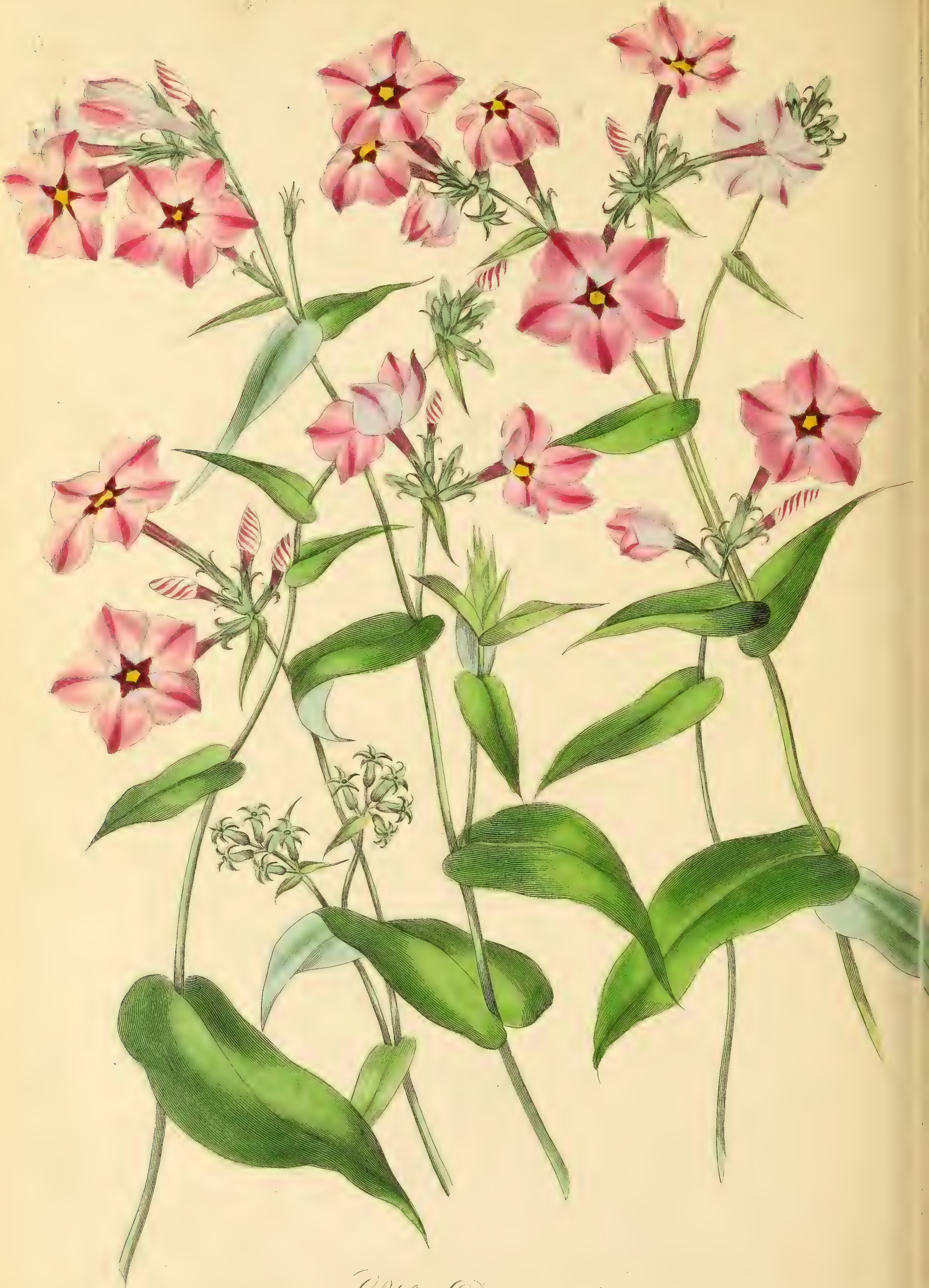
As this species produces seeds very freely, and also is propagated readily by cuttings planted in sand under a bell-glass, we have no doubt but in a few years it will become very common; and being nearly hardy, we may expect ere long to find it one of the most conspicuous summer ornaments in our flower borders. The season for flowering continues, without intermission, from March or April to December; and during that time the plant is literally clothed with flowers.

The best season for planting the cuttings is during the spring months; and if the pots containing them are placed in a gentle heat, the cuttings will soon strike roots, and in three weeks from the time of planting will be ready to pot off. Use soil composed of equal parts of heath mould (peat) and light loam.

The habit of the plants is that of *Nierembergia;* and when quite young and out of flower, they can scarcely be distinguished from *N. gracilis,* except that the leaves of the latter are rather narrower. Our reason for adopting the name given by Mr. Herbert, in preference to that of Mr. D. Don, is, because, however nearly the habit of the plant resembles *Nierembergia,* the flowers, both in form and structure, exactly agree with those of the *Petunia violacea.* (See wood-cut below, and figure, Vol. I., page 7.) The very peculiar form of the corolla, and the recurved stigma of true *Nierembergias*, appear sufficient distinctions to warrant our adopting the above name.

The plant from which our drawing was taken is still beautifully in flower in our greenhouse at Chatsworth, and is likely to continue so for some time.





Phlox Drummondi.

F.W. Smith sc.

PHLOX DRUMMONDII.

(MR. DRUMMOND'S LICHNIDEA.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
POLEMONIACEÆ.

Generic Character.—*Calyx* tubular, fine toothed. *Corolla* tube curved, petals five, salver shaped. *Stigma* trifid. *Capsule* three-celled.

Specific Character.—*Plant* annual. *Stem* from a foot to a foot and a half high, covered with long hairs. *Leaves* on the lower part of the stem opposite, on the upper part alternate, oblong, acute, rather cordate at the base, hairy on the under side, bright green, and partly clasping the stem. *Corymbs* terminal. *Calyx* of fine acute segments, being, like the stem, bright green. *Corollà* salver shaped, tube long, very hairy, pale rose-coloured ; limb spreading, pale rose-coloured without, rich rosy red within ; eye deep crimson ; throat yellow.

This beautiful new species was raised under the care of our friend Mr. Campbell, Curator of the Botanical Garden, Manchester, from seeds which arrived from the late Mr. Drummond, in March last (1835).

We believe it is a native of Mexico, but we are unable to state any particulars of its locality *: as the plant, however, has flowered at the Glasgow Botanic Garden, we may look forward for a figure and further particulars in an early number of the Botanical Magazine, by Dr. Hooker, who, we believe, held a correspondence with Mr. Drummond.

We understand the plant is to be named by Dr. Hooker after its indefatigable discoverer; we have, therefore, adopted the Doctor's proposed name, in anticipation, for two reasons—first, because we are anxious to avoid multiplying the names of any plants—and secondly, because we are happy the Doctor is paying a tribute of respect to Mr. Drummond, in which all who knew his zeal in the cause of botany will readily accord.

Should this lovely species turn out to be an annual, which to all appearance it will, it must be regarded as a novel feature in this favourite genus. The plant is perfectly hardy, and will prove a great ornament to the flower garden.

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* Since the above was written for the press a figure of this beautiful Phlox has appeared in the Botanical Magazine for October, and Dr. Hooker states the plant to be a native of Texas.

REMARKS ON THE CULTURE OF HARDY DECIDUOUS AND EVERGREEN SHRUBS,

WITH A SELECTION OF SOME OF THE MOST BEAUTIFUL.

The culture of hardy shrubs is in general simple and easy, the chief things to be noticed are—the proper season of planting—the situations in which the plants will thrive—the kind of soil best suited for their growth—and the encouragement given to enable them to thrive afterwards.

The proper Season of Planting.—As soon as the leaves have begun to fall in October, deciduous trees may be planted with safety; and although this planting season continues until the trees begin to swell their buds again in the spring, yet those plants have invariably succeeded best with us which were shifted in October, November, February, and March, and those the worst that were planted in December, January, and April.

Evergreens, in general, if taken up carefully, may be planted with success at any season of the year, provided dull or dripping weather be taken advantage of for the purpose. There are particular seasons, however, when they will thrive with much greater freedom than at others. If the situation be dry, and the soil light and sandy, they should be planted (with the exception of hollies) in November and December, if the weather be mild; on the other hand, if the situation be low and the soil retentive of moisture, they should be planted in May. In both cases it is indispensible that all large trees and shrubs be removed with good balls, and that the roots be uninjured. Hollies should always be removed from the end of May to the end of June.

In planting evergreens, I perfectly agree with Mr. M'Nab *, that whether it be done in a dull day, a wet day, or a dry day, it is very necessary to keep in view the expediency of keeping the plants for as short a time out of the ground as possible—if only a few minutes, so much the better; and in all cases, when it can be done, when great numbers are to be planted, we should, if possible, have some men stationed to take up the plants, others to carry them, and a third set to put them in the ground.

"In all seasons, situations, and soils the plants should be well soaked with water as soon as the earth is put about the roots. Where the water is not at hand, so that it may be easily carried or wheeled by men, a horse with a water-barrel on wheels should be used. As soon as the plant has been put into its place the earth should be filled in, leaving a sufficient hollow round the stem, and as far as the roots extend, to hold water, which should then be poured in in sufficient quantity to soak the ground down to the lowest part of the roots; in short, the whole should be made like a kind of puddle."

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* Hints on planting Hardy Evergreens.

"By this practice, which is particularly necessary in spring and autumn planting, the earth is carried down by the water, and every crevice among the roots is filled. Care must always be taken to have as much earth above the roots of the plants as will prevent them from being exposed when the water has subsided. The best plan is to take an old birch broom, or any thing similar, and laying it down near the root pour the water upon it; this breaks the fall of the water, and prevents the roots from being washed bare of such earth as may adhere to them; in this way time is saved, for the water may be poured out in a full stream from a pail, a watering-pot, or even from a spout or pipe in the water-cart or barrel, when the situation is such that this can be brought up to the plant."

"After the first watering has dried up, the earth should be levelled round the stem of the plant, and, as far out as the water has been put on, but not trod; if the plants are large a second watering is sometimes necessary, but in ordinary sized plants one watering is quite sufficient; and after remaining twenty-four hours, more or less, according to the nature of the soil, the earth about the stem, and over the roots, should be trod as firm as possible, and, after treading, should be dressed with a rake."

2. *The Situations in which the Plants will thrive.*—With regard to the situation in which each shrub should be planted little can be said here; to form a correct judgment of this, a knowledge of the natural habitats of each is required; this knowledge may be easily obtained by referring to a botanical catalogue, and other works treating on the subject. Some shrubs love a dry and elevated situation, and will not thrive if crowded with others,—some are rather tender, and must have warm and sheltered places,—others are very hardy, and will thrive planted any where, others again will not grow freely unless they are placed in low, damp ground,—and others do not flourish if much exposed to the rays of the sun; a few particulars of which immediately succeed the present list.

3. *The kind of Soil best suited for them.*—With respect to soil, hardy shrubs may be divided into two kinds, viz. first, shrubs requiring common soil; and second, those shrubs constituting the American garden. A rich, light hazel loam undoubtedly suits the greater part of the first class of plants, although many of the stronger growing kinds will make fine bushes on almost any kind of soil. The American plants, as *Kalmias*, *Rhododendrons*, *Andromedas*, &c. &c., make the finest plants and the best show if they are planted in a soil composed for the most part of sandy peat; but in the absence of this a very good compost may be made for them of light hazelly loam, river sand, and vegetable or leaf mould, equal parts, or a little peat earth mixed with it. After having taken out the original soil from the proposed border to about a foot and a half deep, substitute the above mixture in its place.

4. *To encourage the growth of the Shrubs after being planted.*—Whilst the plants are small constantly keep down all rank growing weeds, and clear off all rubbish that would otherwise greatly retard their growth; also they receive much benefit by the surface of the ground being often stirred with a Dutch hoe, as it prevents the surface baking hard in dry weather. Watering shrubs, except in

peculiar situations, during dry summers appears to be of very little, if any, benefit; on the other hand, it takes up much time, and is the means of the ground baking hard when dried by the sun again. When the shrubs have advanced to a large size all the care required is to cut off overhanging branches, so as not to allow them to smother each other, or the stems of those overhung will become naked and unsightly.

The shrubs in the following list are such as will make a great show at their season of flowering, and, if judiciously planted, will have a splendid effect:—

SELECT LIST OF HARDY SHRUBS.

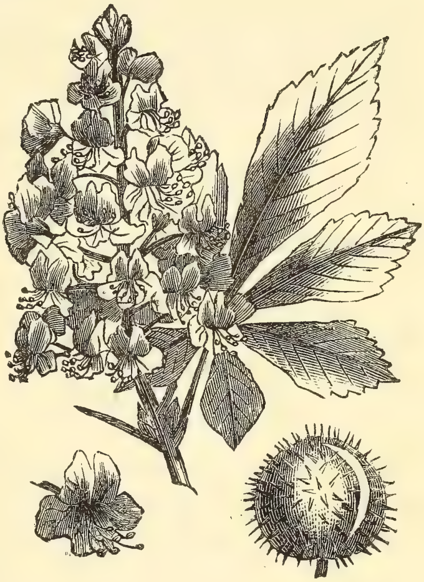
Æsculus discolor.
— carnea.
— rubicunda.
— pavia.
Azalea calendulacea, varieties.
— speciosa, and varieties.
— viscosa and varieties.
— ornata.
Azalea nudiflora, with all its varieties, particularly nudiflora thyrsiflora, and indeed all the kinds are ornamental.
Amelanchier sanguinea.
— florida.
Andromeda speciosa.
— buxifolia.
— racemosa.
Benthamia fragifera.
Catalpa syringifolia.
Chionanthus Virginica.
Chimonanthus fragrans.
— grandiflora.
— luteus.
Calycanthus floridus.
— futilis.
— lævigatus.
— oblongifolia.
— Pennsylvanicus.
Cotoneaster frigida.
— laxiflora.
— microphylla.
Cratægus heterophylla.
— oxyacantha punicea.
— — superba.
— coccinea.
Colutea Nepalensis.
— Pocockii.
Clianthus puniceus.
Cytisus purpureus.
— nigricans.
— falcatus.
— alpinus.
Deutzia scabra.
Edwardsia grandiflora.
Ebenus Creticus.
Enkianthus quinqueflorus.
— reticulata.
Gaultheria Shallon.
Hibiscus Syriacus.
— — variegatus.
Halesia tetraptera.
Indigofera violacea.
Lonicera tartarica.
Magnolia macrophylla.
— grandiflora.
— elliptica.
— crispa.
— lanceolata.
— obovata.
— rotundifolia.
— glauca.
Malachodendron ovata.
Philadelphus grandiflorus.
— hirsutus.
— coronaria.
Prunus candicans.
— Sibirica.
Pyrus coronaria.
— floribunda.
— spuria.
— angustifolia.
— spectabile.
— grandifolia.
Rhododendron cinnamomeum.
— azaleoides.
— Caucasicum.
— — stramineum.
— — formosum.
— campanulatum.
— Cartoni.
— purpureum.
— maximum.
— ponticum.
— obtusum.
— hybridum.
— myrtifolium.
— eximia.
— venustum.
— Lapponicum.
Ribes sanguinea.
— speciosa.
— fragrans.
— aurea.
Spiræa grandiflora.
— trilobata.

Spiræa chamædrifolia.
Symphoria racemosa.
Syringa Josikæa.
Syringa Persica.
— Chinensis.
Viburnum Tinus.

The following short observations on the different species will, to persons not much experienced, be of some use :—

ÆSCULUS.

All the species mentioned in the list are handsome. They all readily unite if grafted on the common kind (fig.), and in shrubberies make a beautiful show when in flower in spring. They flourish in any soil and situation. No plants are better calculated for shrubberies, for although they are deciduous, the variation in foliage from the ordinary shrubs has a charming effect. The *Æ. discolor* seldom grows above six feet high, and therefore will stand pretty forward ; *Æ. carnea* from sixteen to twenty feet : *Æ. rubicunda* from ten to twelve, and the *Æ. pavia* from six to eight feet : the knowledge of their relative heights will determine their situations in the shrubbery.



AZALEA.

All the above hardy species of Azalea grow from four to six feet high ; and they should be planted on a border by themselves, composed of sandy peat (heath mould), and are propagated by cuttings and layers. See vol. 1, page 127, where the particulars of their culture are detailed.

AMELANCHIER.

A. SANGUINEA, or scarlet-wooded *Amelanchier*, bears a strong resemblance to the *Snowy Mespilus*, and is very ornamental ; it is deciduous, and seldom grows above four feet—it is a native of North America. *A. florida*.—This species bears a good deal of resemblance to the *sanguinea*, except in the racemes of flowers, which are produced after the manner of the bird-cherry. It is also a native of North America. Both the species will require a light sandy soil, and about the same situation in the shrubbery, and are readily propagated by layers.

ANDROMEDA.

A. SPECIOSA, and all its varieties, are very beautiful ; they are natives of North America, and flower in great profusion, and continue in leaf nearly the whole year, although they are not strictly evergreen shrubs; they grow about three feet high, and should be planted on the peat border with the *Azaleas*. *A. buxifolia*, *racemosa*, &c. are also well deserving a place in the flower garden; they are all propagated by seeds and cuttings, for particulars about which, see vol. 1, page 165.

BENTHAMIA.

B. FRAGIFERA. This beautiful new shrub is an evergreen, and flowers in profusion during June, July, and August, and produces a crop of large red mulberry-like fruit in the autumn; it was introduced a few years ago from the East Indies. Our plants grow freely in common light soil, and no doubt but they will be increased readily by layers and seeds.

CATALPA.

C. SYRINGIFOLIA. This handsome flowering shrub is deserving a place in every shrubbery; it was introduced by Catesby, who found it in the vicinity of the Ohio and Mississippi. If planted in a warm sheltered place it will flower finely when it has become ten or twelve feet, although the ordinary height it reaches is twenty feet. Common garden soil suits it very well, but if made a little rich it grows more luxuriant. The usual way of propagation is by cuttings of the roots planted under a hand-glass, or by seeds, which may be bought at most of the seed shops.

CHIONANTHUS.

C. VIRGINICA, or Fringe-tree, is a fine large deciduous tree, growing twenty feet or more high; the leaves are broad, like those of the *Magnolia grandiflora*. It is a native of North America, where it was found growing upon the mountains, and is very hardy. A light loam suits it well; but propagation is difficult: budding and grafting on the common ash tree is the usual mode practised. The seeds are a long time before they vegetate after being sown, sometimes more than two years.

CHIMONANTHUS.

C. FRAGRANS. This species, together with the *grandiflora* and *luteus*, are most usually considered to be greenhouse plants, as during the winter their delightful fragrance and lively flowers greatly enliven the appearance of a collection. They, however, grow very freely out of doors on a warm border, or under the wall of a stove or greenhouse. They are natives of China, and grow to six or eight feet high in favourable situations. Any light soil will do for them to be planted in out of doors, but if cultivated in pots use about equal parts of sandy loam and heath mould (peat). The mode of propagation is by layers, which merely require pegging down without any tongue; this should be done in the spring, just when the plants begin to grow. They may also be increased by cuttings of the young wood, which should be planted in sand, and be covered with a bell-glass, and the pots plunged in a gentle heat.

CALYCANHUS.

All this genus are natives of North America: they are very easy of culture, growing freely either in peat or light loam, or both mixed. The flowers are a dark brown colour, and very fragrant, resembling the odour of ripe melons. The usual mode of propagation is by layers, which strike soonest if they are tongued and laid down in sandy peat. They will also grow from cuttings, but not very freely, if planted under a hand-glass in spring under a north wall.

COTONEASTER.

C. FRIGIDA. A low, handsome, deciduous tree, a native of Nepal, where it was discovered some years ago by Dr. Wallich. It bears a profusion of white blossoms in spring, and is covered with bunches of red berries in the autumn. *C. microphylla* is a very different species from *frigida*, being an evergreen shrub, seldom exceeding a foot in height, and bearing solitary white flowers. The foliage is glossy, and very handsome. It is a native of Nepal. *C. laxiflora.*—This is a low deciduous shrub, inferior in beauty to the other two, but possessing many good qualities to recommend it. This and the first are propagated by layers and seeds, and will grow in any common garden soil. The *Microphylla* may be propagated by cuttings planted under a hand-glass in peat earth, on a warm but shady border in August, and they will be ready to pot off the following May.

CRATÆGUS.

To stand as single trees, or be incorporated with others in a shrubbery, perhaps the above kinds of thorn yield in beauty to scarcely any plant, particularly during the month of May, when their leaves are literally hid from sight by a profusion of crimson, scarlet, or white flowers, and in the autumn, when they are covered with red berries. They will grow in any soil and situation, and are readily increased by grafting on stocks of the quince and common thorn, by layers and by seeds.

COLUTEA.

Both these species of bladder senna are very ornamental when planted near the front of a shrubbery; they flower freely, and will grow in nearly any soil or situation, and are readily increased by seeds, which ripen in abundance.

CYTISUS.

These are so well known, that little need be said about them. The *C. purpureus* and *nigricans* are pretty ornaments on the flower borders, where, trained to a stake, they grow from three to four feet high. They also look very pretty grafted upon the laburnum stock, but being feeble growers the stock soon destroys them; the *falcata,* no doubt, would answer this way. They are readily increased by layers and seeds, which ripen freely, also by cuttings.

DEUTZIA.

D. SCABRA. This is a native of Japan, where it was found growing upon the Fakon Mountains. It forms quite a small shrub of slender growth, and may be propagated by cuttings planted under a hand-glass, on a warm shady border. It will grow in any common garden soil.

EDWARDSIA.

E. GRANDIFLORA. This is a native of New Zealand, and is nearly hardy; if planted on a warm border, or under a wall, and sheltered with a mat in severe weather in winter, it will flower very finely, and produce plenty of seeds, by which and cuttings it may be increased. The cuttings should be planted in pots of sand, covered with a bell-glass, and placed in a gentle heat. The seeds may be sown in a slight hot-bed, transplanted when large enough, and afterwards exposed by degrees.

EBENUS.

E. CRETICUS. A small evergreen shrub of considerable beauty; seldom grows more than a foot and a half high; looks very pretty on the flower border, or rock-work. It is a native of Candia, whence it was introduced a few years ago. It produces seeds freely, and strikes freely from cuttings, planted in a light soil under a hand-glass, on a warm border.

ENKIANTHUS.

These are elegant little bushes, belonging to *Ericeæ*, generally considered greenhouse plants; but they are more hardy than most plants requiring that shelter. They do not bear the cold of our winters out of doors well, but only require sheltering in a frame or pit if in pots, and the shelter of a mat in the open borders. The best soil for their growth is sandy loam and peat (heath mould), and care is requisite not to over-water them when not in a growing state. They are propagated by cuttings, which strike without difficulty. The cuttings must be taken when the wood is ripened, and be planted in sand, under a hand-glass, without heat.

GAULTHERIA.

G. SHALLON. This is a new and very pretty evergreen shrub, a native of North America, from whence it was brought to this country by the late Mr. David Douglas. For further particulars, see vol. 1, page 160.

HIBISCUS.

H. SYRIACUS, or *Althæa frutex*, is well deserving culture, see vol. 1, page 77; and the *H. Syriacus variegata* is very handsome, see present volume, page 3.

HALESIA.

H. TETRAPTERA. A native of Carolina, where it was found growing on the banks of rivers. It grows very well in a light rich loam, but it is very difficult to propagate; the best way is by seeds, which are imported from its native country. It may also be increased by cuttings of the roots, planted under a hand-glass, without heat.

INDIGOFERA.

I. VIOLACEA. A dwarf, slender shrub, very handsome when in flower, but not very hardy, it should therefore be planted in a warm situation. It will thrive in any common garden soil, and increases freely by cuttings planted in pots of light soil, or sand, covered with a glass, in a gentle heat. It also occasionally produces pods of seeds, which should be sown in a gentle hot-bed in March.

LONICERA.

All the species of this genus, as now constituted, are upright shrubs, the climbing kinds being referred to *Caprifolium*. *L. Tartarica*, and its variety *rubra*, form beautiful shrubs, ten feet or more high, being clothed in April and May with flowers from top to bottom. They are perfectly hardy, and thrive in almost any soil and situation. They are natives of Russia, and are propagated easily by layers, cuttings, and seeds.

MAGNOLIA.

The whole of the trees in this genus are highly ornamental, and very valuable. All the American species and varieties are hardy, but those from China require the shelter of the greenhouse.

M. GRANDIFLORA is a splendid evergreen tree rising, in its native country, to sixty feet or more, but with us scarcely exceeding thirty or forty feet. The leaves grow from eight inches to one foot long, in form not unlike those of the common laurel; the flowers are white, of a large size, and emit a pleasant fragrance. The plant is not so hardy as some other species, and should therefore be planted in a warm situation. We have a plant growing exceedingly fine, trained against a south wall. All the varieties belonging to this species, as *elliptica, crispa, lanceolata, obovata, rotundifolia,* &c., require similar treatment.

M. GLAUCA. This is also a native of North America, where it is found growing in low, wet, swampy ground; it is deciduous, and grows to about twenty feet high. The flowers are cream-coloured, bordering on light yellow. In America the tree is best known by the name of "*White, or Swamp Laurel.*" The blossoms are delightfully fragrant, and a recent traveller states that, on the windward side, the scent may be distinguished for some miles before reaching the tree. All the varieties of this species are found in similar situations. The *M. glauca* is very hardy, and may be planted in almost any conspicuous situation, where it will not be exposed to the violence of cutting winds.

M. MACROPHYLLA. This species is found in similar situations to the last, but to thrive requires more shade. The leaves are very large, measuring, on a healthful growing plant, nearly three feet long and a foot broad. The flowers, too, are very large, being nearly a foot across when fully expanded. They are of a delicate cream-coloured white, tinged with deep purple at the base of the petals. They also emit a pleasant fragrance.

From the above remarks we learn that *M. glauca* and its varieties may always be planted in situations more exposed and moist than will suit the varieties of *M grandiflora* and *macrophylla*, which, in their native country, are sheltered from cold by the extensive forests in which they grow.

The best kind of soil for all the hardy species of magnolia is peat; but, if all other circumstances agree, they will thrive exceedingly well in light loam, or in a mixture of that and peat.

There are two ways of propagation practised, viz. by layers and by seeds.

The usual way, and probably the best way, of increasing them is by layers, which should be tongued on the upper side, and layered down in March or April, and most likely by the autumn they will be ready to separate; if, however, they have not made good roots, it is advisable to allow them to remain where they are until the following spring.

When the layers are separated, pot them in 48-sized pots, filled with a mixture of sandy loam and peat, or peat alone, place them in a frame, and keep them close shut down until they begin to grow; then gradually admit air, and treat the layers like greenhouse plants, potting as they require it until they are established, and have grown to a good size; then plant them in suitable situations, and they will speedily show flower.

The seeds imported from America should be sown immediately on their arrival, in pots or pans filled with light sandy loam and peat, or peat alone, covering the seeds very lightly. Place the pots in a gentle heat, and they will soon begin to vegetate. When they are of a sufficient size, plant them out into 60-sized pots, one plant in each pot; replace them in the frame, and shade them until they have begun to grow. When they have become established take them out of the frame, and treat them whilst small in every respect like greenhouse plants; when they have grown to a good size, plant them finally in the situations where they are to stand permanently.

MALACHODENDRON.

M. ovata. This beautiful tree is a native of North America, where it is found growing on mountains. The flowers are cream-coloured and of a large size. It is hardy, but requires a warm and sheltered situation, otherwise the unripe wood is often killed in winter, and this causes the plant to flower weakly. A mixture of loam and peat is the best kind of soil for it; and it may be increased both by cuttings and layers. Let the cuttings be made of the ripe wood, and planted in autumn on a warm south border under a hand-glass in sand; or they strike quicker if introduced into a gentle heat. The best time for pegging down the layers, is early in spring; they strike in less time if they be tongued on the upper side, and the branch slightly twisted.

PHILADELPHUS.

P. grandiflorus. This is the handsomest of this genus; it is a native of North America, where it is found growing on the banks of rivers. It is perfectly hardy, and will grow in almost any soil and situation, forming a spreading shrub about six feet or more high; and is easily propagated by layers.

P. hirsutus. This shrub grows from four to five feet high; like the last, it is a native of North America, where it was discovered by Mr. Nuttall. It thrives in the shrubbery in any common garden soil, and is propagated like the last.

P. coronarius, or Common Syringa, greatly resembles the others, grows about five feet high, and is delightfully fragrant when in bloom. It may be propagated like the last.

PRUNUS.

P. candicans. This is a delightful hardy deciduous shrub, growing about six or eight feet high. It is very easy of cultivation, and in May and June, when in full flower, is a perfect picture, the white flowers nearly hiding the young leaves, which are beginning at that time to cover the branches. It may either be propagated by layers, or by budding and grafting on the common plum stock.

P. SIBIRICA scarcely grows so large as the *Candicans,* thrives well in almost any soil and situation, and makes a pretty ornament when in flower. It may be increased both by layers, and budding or grafting on a common plum stock.

PYRUS.

P. CORONARIA. This beautiful crab tree is a native of North America; it grows upwards of twenty feet high: in May, when it flowers, a delightful fragrance is emitted, which in the evening perfumes the whole of that part of the garden. It will grow in almost any low situation; and may be propagated by grafting on other crab stocks, or by layers. Deciduous.

P. FLORIBUNDA. This forms a broad-spreading but not very lofty bush, which in spring is thickly covered with blossoms, and in autumn with purple berries. It grows freely in common garden soil, and may be propagated by the same means as the *Coronaria.* Deciduous.

P. SPURIA. A small deciduous shrub, very hardy, and easy of propagation; grafted upon the common crab or pear stocks it grows very freely.

P. ANGUSTIFOLIA. This very pretty shrub rarely loses all its leaves; for although not an evergreen, the leaves of the previous year seldom fall until new ones are produced. It resembles in size *P. coronaria,* seldom growing above eight feet high. It is propagated by grafting on the crab stock, and by layers.

P. SPECTABILE is a native of China, and should be planted in a warm situation. Any light soil will suit it. Propagation is the same as the other species.

P. GRANDIFOLIA. This is a handsome shrub, rarely exceeding six feet. It will grow in any soil and situation, and is propagated the same as the other species.

RHODODENDRON.

Rhododendrons are easy of culture, merely requiring to be planted in situations rather shaded and damp, and the soil to be sandy peat (heath mould), or peat and loam mixed. They are propagated by layers, by cuttings, by separating the plant at the roots, and by seeds.

R. CINNAMOMEUM is a splendid plant, growing to the height of twenty or thirty feet, and spreading wide in proportion. The situation in which it is planted must be well sheltered from cold winds, and have a little morning sun, and there will be little doubt of it thriving.

R. AZALEOIDES and its variety *odoratum* are low bushes, seldom exceeding four feet; they are more hardy than the last, and thrive well on a north border.

R. CAUCASICUM and its two varieties usually grow from two to three feet high, but rarely exceed two, except in very favourable situations; they are very beautiful, and require only ordinary care to bring them to perfection.

R. CAMPANULATUM is rather tender, and should be treated like *cinnamomeum* It is a native of Nepal, where it grows upon the mountains.

R. cartoni, purpureum, maximum, ponticum, obtusum, hybridum, and *myrtifolium,* are nearly all alike hardy, and require much the same treatment, both as respects situation and other particulars.

R. NUDIFLORA EXIMIA is a hybrid of great beauty, raised by Mr. Smith betwixt the *Azealea nudiflora coccinea,* and *Rhododendron arboreum;* it will prove, no doubt, a beautiful addition to the flower border. We are only acquainted with it by the figure in *British Flower Garden, t.* 291.

R. ARBOREUM VENUSTUM. This little beautiful variety grows about eight inches high. It is a hybrid raised by Mr. Smith from seeds of *R. Caucasicum*, fertilised by *arboreum*. We are only acquainted with it by the figure given in *British Flower Garden, t.* 285.

R. LAPPONICUM is a beautiful low spreading shrub, scarcely exceeding six inches in height; it has been long known and deservedly cultivated in the gardens, being a great ornament in front of the American border, flowering with the greatest freedom.

Propagation of Rhododendrons by Layers.—When the plants are in full growth, merely peg down the young shoots, without any incision, and cover them with about two inches of soil, and by the following spring they will be ready to separate.

Cuttings of half ripened wood planted under a hand-glass in September, on a north border, in peat earth, will often strike, and make good plants, but layers are preferable.

Separating the plant at the roots.—This is merely tearing off or separating with a sharp knife, those branches with roots attached to them, which is the case when many branching stems spring from the same root.

By seed.—Sow the seed on a bed of peat soil (heath mould) if there is a considerable quantity, but if only a small portion, sow in a pan or box, because of the ease with which the latter can be protected by placing it in a frame. If sown on a bed, shelter the plants while young from heavy rains, &c., by mats or hoops. Transplant, when large enough, into other beds, or into pots, and continue to shift them every two years, till they are large enough to plant into their permanent situations.

RIBES.

" It is well known that of *Ribes*, the genus to which the gooseberry and currant belong, many species, indigenous to both northern and southern America, do, in their native soil, produce excellent fruit, while the same species, when transported to an English climate, seldom bear any, or, when they do, the flavour is either almost insipid, or in no small degree astringent. A few exceptions, however, occur.

" Among the numerous species introduced within these few years, and chiefly natives of America, few possess greater claims on our attention as ornamental shrubs, than the *R. sanguineum* *. This plant in its natural state produces abundance of fruit, but of so musky and unpleasant a flavour, that the berries continue to hang on the bushes throughout the winter, even the birds refusing to make them a part of their food. It can hardly be expected to improve materially by culture; certainly never to such a degree as may entitle it to the rank of an edible fruit; but it possesses considerable recommendations of another kind. Whether we consider the delicate tints of its blossoms, which appear in March and April, the elegance of its foliage, the facility with which it is increased and cultivated, or its capability of enduring the severest of our winters without the least protection, it may be regarded as one of the finest and most interesting additions that have been made to our shrubberies for many years †."

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* Figured at page 3, vol. i. of this work.

† Horticultural Transactions, vol. vii. p. 508.

R. SPECIOSA. This belongs to the gooseberry division of *Ribes,* and though inferior in beauty to the *R. sanguinea,* it certainly is very handsome. The flowers are a bright crimson, far superior in brilliancy to those of *R. sanguinea;* they are pendent, and resemble in form those of *Fuchsia.* The plant, however, does not make a conspicuous appearance on the border, like *sanguinea,* because its flowers are not so numerous, and are partially hid amongst the leaves. Our plants appear very hardy, are easily cultivated, and may be propagated by cuttings. Any light soil appears to suit them.

R. FRAGRANS. This is also a native of North America. The flowers bear a resemblance to those of *R. aureum* (to which, if not the same plant, it is very nearly related). They are rather showy, and delightfully fragrant. The plant grows freely in almost any soil, and is readily increased by layers and cuttings.

SYRINGA.

This genus is remarkably well known. The varieties of *S. vulgaris* are well calculated to plant back in large shrubberies, and the *Persica, Chinensis,* and *Josikœa,* for small clumps. They are all increased by layers and suckers from the roots.

SPIRÆA.

S. GRANDIFLORA is a native of Kamtschatka, is perfectly hardy, will flourish in any light loam, and is easily propagated by layers and cuttings. *S. trilobata* and *chamædrifolia* also require precisely the same treatment as *grandiflora.*

SYMPHORIA.

S. RACEMOSA. This is a pretty little deciduous shrub, a native of North America. It will thrive if planted under the shade of other trees, in any light soil, and may be readily increased by cuttings planted under a wall early in spring.

Besides such as are mentioned in the above list, we may name white and red cedars, common and Portugal laurels, arborvitæs, hollies, berberries, sweet bays, laurustinas, and roses, both deciduous and evergreen, for the borders; also standard roses and robinias, for the grass lawn, than which perhaps nothing has a more graceful appearance; cypress and plane trees to plant near old ruins, and many other plants which are too common to need enumerating here.

One thing, however, should not be forgotten in this place, for to many persons selecting trees and shrubs for planting, it is of importance, viz. at what time of the year the above shrubs are in flower. When a family visits a country seat only once a year, and that in autumn, the gardener particularly wishes that the shrubbery and garden should look as gay and lively as possible, spring flowers are to him not of so much importance, whilst, on the other hand, if the family resides there in the spring, or the whole of the year, they wish to see a good show early in the spring, as well as in autumn and summer. If the above list will assist the person's memory, and enable him to make a good selection for planting, to flower at the time of year he may want, and to plant them in proper soil and situations, the end of giving it is fully answered.

Shrubs Flowering in January.

YELLOW FLOWERS.

Chimonanthus fragrans.
— — grandiflora.
— — luteus.

Shrubs Flowering in March.

FLOWERS WHITE.

Hibiscus Syriacus.
— — variegata.

FLOWERS ROSE-COLOURED.

Enkianthus quinqueflorus.
— reticulata.
Rhododendron venustum.

FLOWERS CRIMSON OR RED.

Azalea nudiflora thyrsiflora.
Ribes sanguinea.
— speciosum.

FLOWERS YELLOW.

Ribes aureum.
— — fragrans.

Shrubs Flowering in April.

FLOWERS RED.

Andromeda buxifolia.

YELLOW.

Cytisus falcatus.
— nigricans.
Edwardsia grandiflora.
Rhododendron Caucasicum stramineum.

ROSE-COLOURED.

Gaultheria Shallon.
Lonicera Tartarica.

FLOWERS WHITE.

Cotoneaster laxiflora.
— frigida.
— microphylla.
Philadelphus coronaria.
— grandiflora.
— hirsutus.
Prunus candicans.
Pyrus spectabile.
Rhododendron campanulatum, and Azaleas of many sorts.

Shrubs Flowering in May.

FLOWERS WHITE.

Amelanchier sanguinea.
— florida.
Catalpa syringifolia.
Cratægus heterophylla.
Deutzia scabra.
Halesia tetraptera.
Prunus Sibirica.
Pyrus grandifolia.
— spuria.
Rhododendron Caucasicum.
— — formosum.
Spiræa trilobata.

FLOWERS ROSE-COLOURED.

Æsculus discolor.
— pavia.
— rubicunda.
Cratægus oxyacantha superba.
— — punicea.
Cratægus coccinea.
Ebenus Creticus.
Pyrus coronaria.

FLOWERS YELLOW.

Azaleas of several sorts.
Colutea Nepalensis.

FLOWERS PURPLE.

Rhododendron Ponticum and its varieties.
— myrtifolium.
Syringa Chinensis.
— Josikæa.
— Persica.

FLOWERS BROWN.

Calycanthus floridus.
— futilus.
— lævigatus.
— oblongifolia.
— Pennsylvanica.

Shrubs Flowering in June.

FLOWERS WHITE.

Chimonanthus Virginica.
Magnolia grandiflora.
— elliptica.
— obovata.
— lanceolata.
— rotundifolia.
— crispa.
— glauca.
— macrophylla.
Spiræa grandiflora.
— chamædrifolia.
Benthamia fragifera.

FLOWERS PURPLE.

Rhododendron purpureum.
— maximum.
— cinnamomeum.
— obtusum.
— azaleoides.
— hybridum.
— myrtifolium.
Rhododendron Cartoni.
Cytisus purpureus.

FLOWERS ROSE-COLOURED.

Æsculus carnea.
Rhododendron Lapponicum.
Spiræa grandiflora.
Andromeda glauca.
— rubra.
Cytisus albus incarnatus.
Erica cinerea.
— vulgaris.
— — pleno.
Kalmia cuneata.

FLOWERS YELLOW.

Azalea speciosa, and many other kinds.
Colutea arborescens.
Punica Granatum luteum.
Hypericum, of many species.
Helianthemum, of many species.
Rhododendron chrysanthum.
Cytisus lanigera.

Shrubs Flowering in July.

FLOWERS PURPLE.

Indigofera violacea.
Azalea nudiflora purpurea.
Rhododendron punctatum.

FLOWERS WHITE.

Malachodendron ovatum.
Andromeda speciosa.
— floribunda.
Rhododendron ferrugineum album.
Symphoria racemosa.

FLOWERS ROSE-COLOURED.

Kalmia latifolia.
Ericas, of various kinds.
Rhododendron ferrugineum.
— hirsutum.
Azaleas, of several kinds.

FLOWERS YELLOW.

Azalea calendulacea, several varieties.
Berberis, of two or three kinds.
Hypericum, of several kinds.
Azalea Pontica cuprea.
Spartium junceum pleno.

Shrubs Flowering in August.

FLOWERS PURPLE.

Hibiscus Syriacus rubra.

FLOWERS WHITE.

Magnolia glauca Thompsoniana.
Spiræa sorbifolia.
Hibiscus Syriacus alba.

FLOWERS ROSE-COLOURED.

Roses of several varieties.
Erica striata.

FLOWERS YELLOW.

Adesmia viscosa.
Cytisus hirsutus.
Colutea Nepalensis.

A WORD ON AVIARIES OF SMALL BIRDS,

WITH A NOTICE OF THE VALUE OF "BECHSTEIN'S CAGE BIRDS," AS A GUIDE TO THE PERSON WISHING TO PRESERVE THEM IN HEALTH.

It has been said, and with much reason, that the love of flowers is a passion naturally implanted in the human breast, and when properly cherished, will greatly augment the happiness of life down to the latest period; perhaps the same may be said, and with equal force, of another branch of natural history, viz. the feathered songsters of our woods.

If we carry our recollections back for twenty, thirty, or forty years, when we were school-boys, so many pleasing associations are connected with our bird-nesting rambles, that although anxieties, troubles, and absorbing cares have mingled with the pleasures of many subsequent years, the joy of our youthful days are still fresh in mind; and present enjoyment is still derived from the songs of birds, which, "of all inferior creatures, Heaven seems to have intended as the most cheerful associates of man."

A taste for the scenes of nature, says Mr. Slaney, the author of a little work on British Birds, affords constant amusement and delight; and for the truth of this in respect to birds, we may ask, who that has repaired to the fields in spring, at the dawning of the day, and listened to the lively music of the lark as he ascended from his grassy bed, and carolled his morning song, the loud echo of the song thrush on the extreme branch of a lofty ash tree, the blackbird in the low thicket, or the goldfinch on the summit of the lofty elm, and the linnet on the slender twig of the hawthorn hedge, attended with a thousand cheerful chirps from every quarter around,—who has not felt a thrilling emotion which scarcely any thing else in creation could have produced? For although we are quite alive to the injury our gardens sustain from several species, yet the number of these depredators being so limited, the cheerful songs and lively presence of others more than compensate for the injury.

The enjoyment of birds is not merely confined to listening to their song in the woods and fields; they are pleasing company, if allowed plenty of room for exercise, when introduced into our drawing-rooms and conservatories,—the latter named places they render particularly cheerful. For their accommodation a large inlet might be contrived in the back wall, the front of which, if wired ornamentally, would be an addition to the beauty of the place. This apartment might be occupied by canaries, goldfinches, siskins, &c. &c., together with many foreign birds of a rich and splendid plumage, which with proper care might be kept in perfect health and vigour, and, if thought proper, might be allowed to breed in their confinement.

As a guide to all who feel an interest in keeping these little creatures, we recommend the perusal of "Bechstein's Cage Birds," originally published in the German language, but some years ago translated into English, which, of all books on the subject that we have met with, certainly merits the most attention, as the numerous editions it has passed through, both in the original German and in its translated form, serve to prove. Some years ago, when we had the care of a large aviary of small birds, a former edition of this work was placed in our hands: we endeavoured to follow its rules, and from experience we are able to say, that the practice of them gave us the most perfect satisfaction, rarely having a sickly bird in our stock.

The new edition of this present year is superior to any that have appeared before, having numerous notes appended to it by the translator, of all the subsequent experience of individuals who have succeeded in preserving in health several species which were not thought capable of living in health in confinement, as the Hon. and Rev. W. Herbert, the late Mr. Sweet, Mr. Blythe, and others.

The work is in small octavo, containing 434 pages, neatly printed, and sold at a moderate price by Orr and Smith, Paternoster Row, London.

WINTER MANAGEMENT OF HOT-HOUSES OR PLANT STOVES.

The season of winter approaches; we are already far advanced in the autumn, and the genial, maturing influence of the orb of day is greatly diminished. The sun, when he even condescends to show his face, appears "shorn of his beams." Any one, in fact, who is familiar with the plant stove, must be sensible of the loss of heat in the rays which are imparted. Under these circumstances, and in conjunction with the great and increasing length of the nights, it must be, or ought to be, manifest that the culture of the plants should be conducted on a system more or less in accordance with that of nature.

Autumn prepares the way for winter, and the latter is a season of repose, at least, if not of sleep, and absolute torpidity.

The experienced gardener is aware of these facts, and the following observations may, to him, appear trite and uncalled for. We do not, however, address the practical man, though it would be no difficult matter to show that, in nine cases out of ten, the science of the professed horticulturist is little else than the confirmed habit of routine, founded upon no philosophical principles whatsoever; we address the proprietor of this beautiful work, and, through the medium of his pages, those persons of refined taste, who are desirous to secure all the advantages which a mode of artificial culture under glass may present. These are many; one, and not the least of them, is this, that the most delicate occupant of the stove or greenhouse, though its leaves and flowers be tender and delicate as the spider's web, is effectually protected from the injury which the withering power of the direct ray, the violence of stormy wind, and the peltings of rain and hail, are certain to inflict on every vegetable being exposed to their power.

It is very certain that there are two distinct states in the existence of every plant; one of quietude and repose, the other of development and display. Upon the basis of this fact we shall found these observations, which we trust will afford real pleasure and matter for reflection to the genuine lover of plants. If we err in the view we take, we look for our justification to the sincerity of our motive and the liberality of the reader. The plants which are cultivated in hot-houses are chiefly the natives of tropical climates; hence the idea has prevailed that they require a steady undiminished heat of from 60 to 70 degrees of Fahrenheit's thermometer.

If it be supposed that these high degrees of temperature exist at all seasons in the hot countries, a great mistake is committed, for even in the torrid zone, within a few degrees north and south of the line, severe cold frequently is experienced, and in the hilly districts unequivocal evidence of actual frost is sometimes afforded; yet the pine apple, a plant which flourishes with prodigious luxuriance in the pestilential vapourous atmosphere of Batavia, and of the close woods of western Africa, and supports the utmost extremes of heat, will, nevertheless, sustain a degree of cold below that of the mean temperature of our climate in February, without manifest injury.

It should also be recollected that in our artificial mode of treatment, we afford protection and complete shelter from storms of wind and rain—circumstances of great importance, even in the finest seasons.

The glare of sun-light also is mellowed and softened by a medium of glass; and of this any one may convince himself by removing a fig-tree in a pot, which is in perfect luxuriance while in the stove, and placing it at once in the open air, exposed to the rays of a spring sun. The almost immediate effect upon the leaves will be astonishing; those broad, expanded, and powerful organs, which had luxuriated in an atmosphere of 90 and 100 degrees, will droop, shrivel, and, in most instances, fall off, though another tree of the same species, growing in the open air, and within a few yards' distance, shall remain entire and unscathed.

This fact, which proves that direct heat is not the operating cause of the injury, bears forcibly upon the practice of removing plants that have been retained for months under glass suddenly into the open air, a practice than which nothing can be more injudicious, unless a very shady and protected spot can be selected in the first instance.

Protection being thus secured, we have no hesitation to assert that as the sun's altitude declines, and the dark and torpid season approaches, the temperature of the house ought to be suffered to decline in proportion.

Wherever great heats prevail in nature, *there* light and length of day are concomitants; therefore, in our climate, when the nights are increased to fifteen and sixteen hours' duration, temperature ought to be correspondingly lowered.

Three successive winters have now afforded convincing proofs that almost every tree or shrub of the East and West Indies will live and be in health, when the thermometer in the house is not higher than 50 degrees during the whole of December.

The plants will not *grow*, it is true; many will become deciduous, some will lose a portion of their leaves, but all will revive, and wake to life and increased energy, under the influence of the vivifying principle of light.

Beauty, perpetual verdure, and floral developments, cannot be forced. Plants cannot grow at all seasons; repose and sleep are required by all created things; therefore, the gardener who endeavours to keep up by heat during darkness, gloom, and frost, those effects of vital action which depend upon light and solar influence, must effect his object, if effect it he can, at the expense of those stores of supply which have been accumulated for the production of the fresh organs and developments in the ensuing spring.

Hot house plants revel in a moist atmosphere and great heat during the advanced spring and high summer months, but they seek repose and freedom from offensive damp during winter. The autumn prepares them for this torpid condition.

Let us then gradually desist at that season from raising steam, and, indeed, any degree of moisture beyond that which will be yielded by the surface soil of the pots. From the commencement of October to the second week in March, let the air be kept dry, and water given in the lowest degree which will sustain life, and we need not be apprehensive of any bad consequences from the cold of night.

Frost we would guard against, and indeed would not habitually suffer a decline of the mercury below 48 degrees; but it is mere waste of health, time, and fuel, to aim at high temperatures, when all they could effect would be to cause elongation of parts, to "draw" the plants, without supplying them with any vigour of constitution.

We witnessed a fact last April only, which, to us, was absolutely conclusive, though the force of prejudice and habit did not permit it to convince the gardener. A vinery was under forcing for a May crop of Hamburghs and grizzly Frontignans. In one of the severe nights of the month, the rope of a large light gave way, and let the light slide down to its utmost extent. In that state, wherein twenty clusters remained directly exposed to a nearly frosty air for hours, was the house discovered after 6 o'clock, A. M., but not a leaf nor a bunch was injured. We had just pointed out several broken large panes, whereat a stream of cold air had poured for many days, precisely in proof of our argument that the decrease of 10 or 15 degrees during night would do no injury, and our remark led to the anecdote of the light. A finer crop of grapes is seldom seen than those produced by our friend, but no conviction is yielded by facts; he still believes that 70 degrees by day and night must be equally maintained *by fire*, during the progress of the grapes!! It may indeed be said that "truth remains at the bottom of a well!"

Other facts connected with plants of ornament shall be adduced soon.

OPERATIONS IN THE FLOWER GARDEN FOR NOVEMBER.

Anemones planted during this month will produce flowers about the middle of May. See the particular directions, vol. 2, page 17.

Gardenias.—Cuttings of *G. radicans*, which were put in last month, give a brisk bottom heat, and as soon as they have made good roots, pot them off into sixty-sized pots, and treat them as recommended, vol. 1, page 226.

Bouvardia triphylla growing in the open borders, if not convenient to take up and pot, cut off the tops, and place a flower pot over the roots to protect them from frost or heavy wet. Vol. 1, page 226.

Oxalis crenata.—Take up the tubers on a fine day, and allow them to be exposed a while to the sun, in the same manner as potatoes; afterwards remove them to the store-room, and keep them from dampness until the planting time next April. All the greenhouse species, the tops of which are dead, place in dry, cool situations, and give no water until spring. Vol. 1, page 230.

Calochortus.—The bulbs of the different species which were taken up in September should be planted again in forty-eight sized pots by the middle of this month. Vol. 1, page 175.

Gladioli in the open borders, and those in pots, now placed in frames, must be sheltered from excessive wet. Vol. 1, page 97.

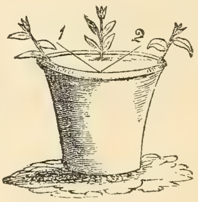
Greenhouse Plants, during this month particularly, must have a deal of air and very little water, and if the house in which they grow become damp, a little fire must be made to dry it, or the plants will soon suffer injury.

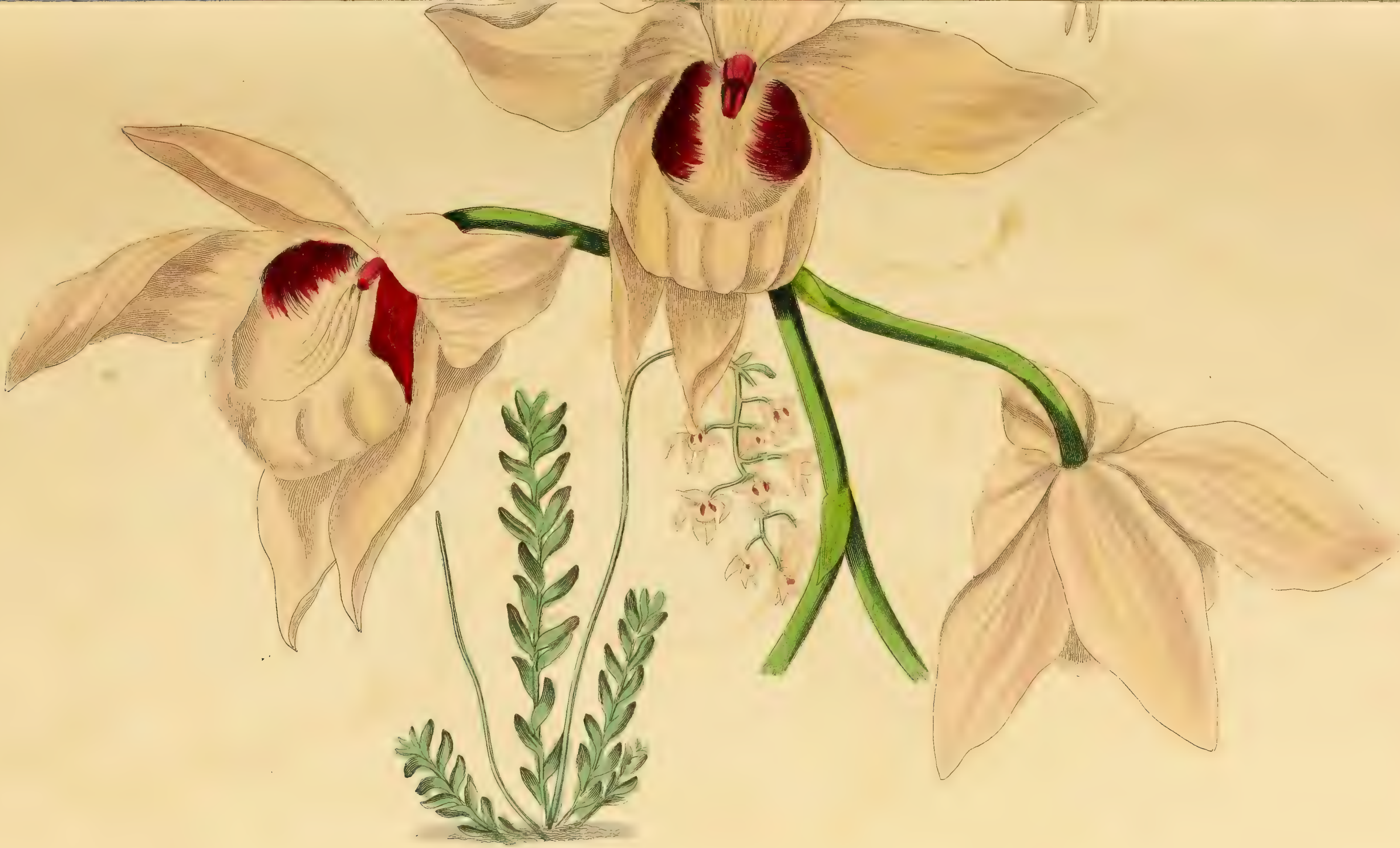
Stove Plants will require much less heat now than they have been accustomed to for some months. Keep the heat about sixty degrees Fahrenheit, and never allow the thermometer to rise above seventy by fire heat; also be very sparing of water this month, as the greater part of the plants will now be wintering.

Succulent Plants should be kept cool and have no water at all.

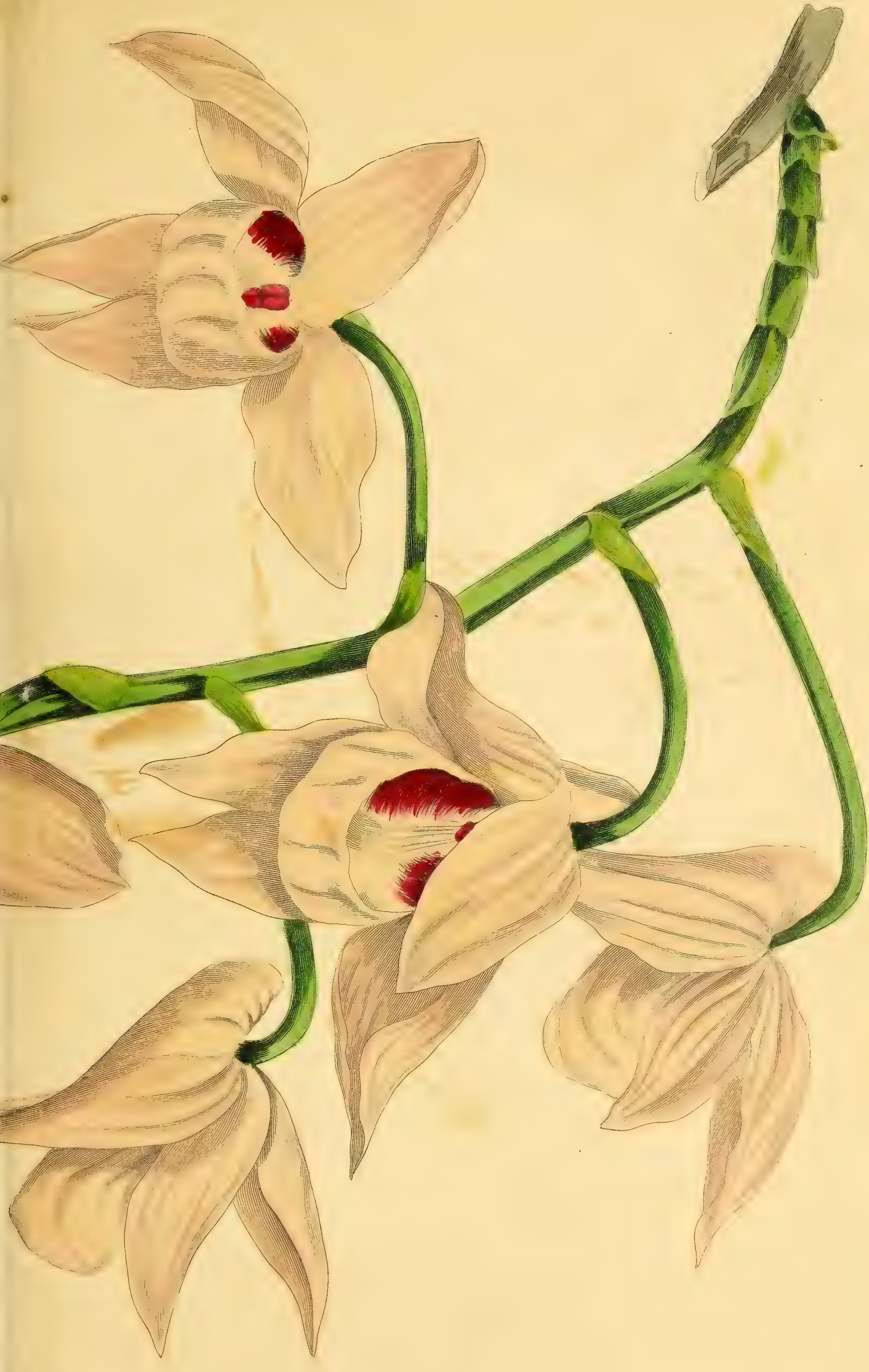
This is also the season to make any alterations in the pleasure or flower gardens that may be deemed necessary, and to collect soils for the various kinds of plants.

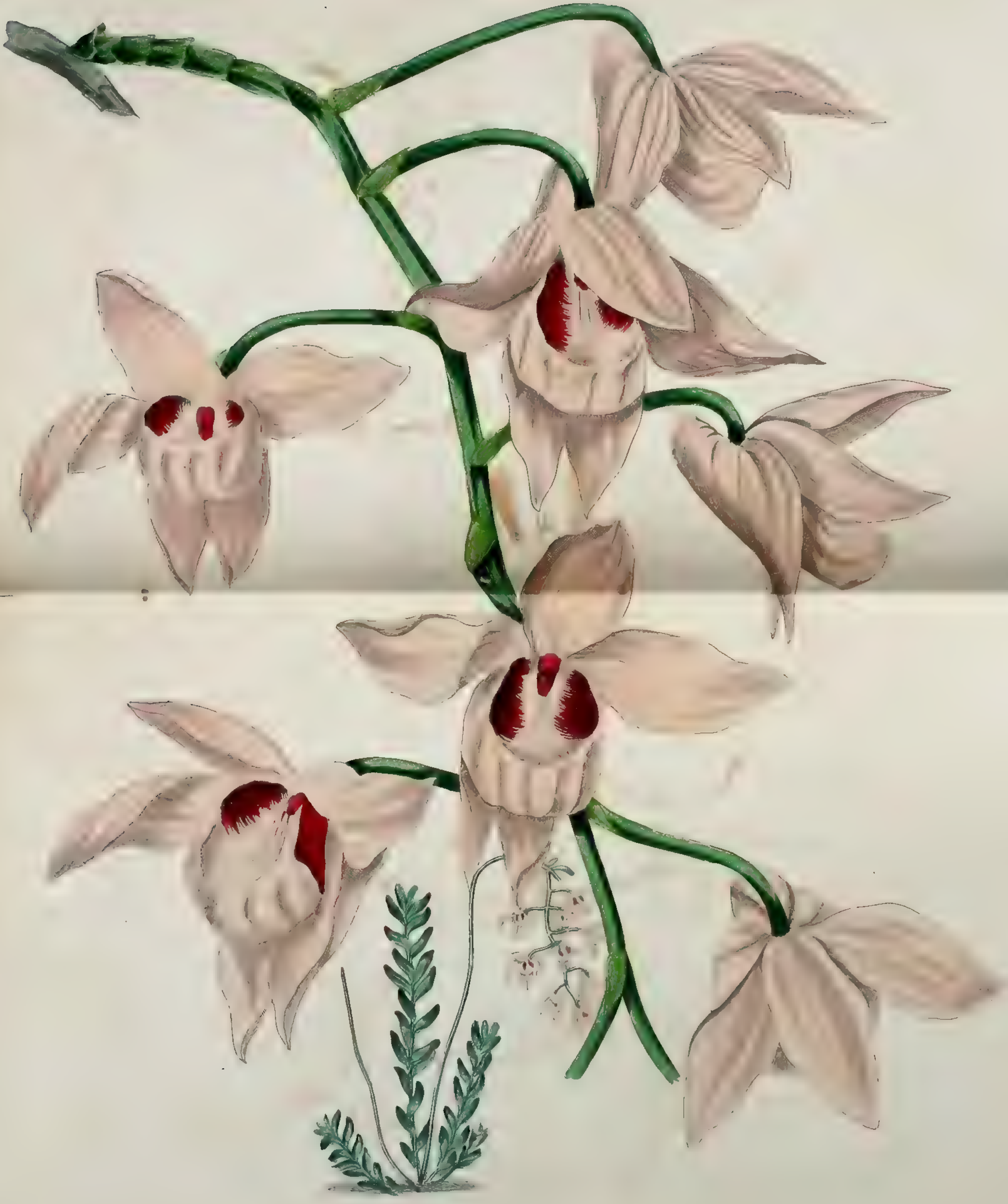
Cuttings of plants put in now do not strike so readily as at other times in the year, but with proper care they will grow. Plant them close to the edge of the pot, as in the annexed figure.





Dendrobium moschatum





Dendrobium moschatum

DENDROBIUM MOSCHATUM.

(MUSK-SCENTED DENDROBIUM.)

CLASS.	ORDER.
GYNANDRIA.	MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

Generic Character.—*Lip* spurless, joined with the claw of the column. *Pollen masses* four, parallel. *Pollen* waxy.

Specific Character.—Epiphyte. *Stem* upwards of four feet high, pendulous. *Leaves* oblong-linear, blunt, alternate, striated with purple. *Flower stem* radical, ten or twelve feet long, pendulous, slender, naked and upright from eight to nine feet, producing on the pendulous part nine to twelve flowers. *Flowers* beautiful, large, measuring, when expanded, nearly four inches diameter. *Sepals* or calyx leaves and *petals* oblong, obtuse, spreading, rich orange, faintly striped with cream-colour. *Labellum* or lip, slipper shaped, slightly hairy outside, same colour as the sepals and petals, inside richly feathered with dark crimson. *Column* dark crimson.

Synonym.—Epidendron moschatum.

We believe this beautiful species has never been previously figured. It is a native of Pegu, where it was discovered by Dr. Wallich, and introduced to this country in 1828.

The flowers are very splendid, and of a very large size, being nearly four inches in diameter when fully expanded. The rich orange colour, contrasted with the bright crimson in the inside of the lip, gives a very fine effect, and renders this one of the most desirable kinds hitherto introduced.

The plant from which our drawing was made flowered in May last, in the splendid collection of Messrs. Loddiges. The flower stem grew nearly nine feet high, and the drooping part was covered with flowers. The flowers emit a pleasant musk-like scent, very perceptible towards evening, from which circumstance the specific name is given, we believe by Dr. Wallich.

The diminished figure in the back ground will give a pretty good idea of the appearance of the plant when in flower.

It appears to delight in a good heat, and grows freely potted in turfy peat cut in squares, and piled up, as recommended for *Stanhopeas*, page 141. It may be increased by division at the roots.

RONDELETIA SPECIOSA.

(SHOWY RONDELETIA.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
CINCHONACEÆ.

Generic Character.—*Flowers* monopetalous, superior. *Calyx* four or five-cleft. *Corolla* funnel-shaped, four or five-lobed, segments roundish. *Stigma* bifid. *Capsule* round, four-valved. *Seeds* several or solitary.

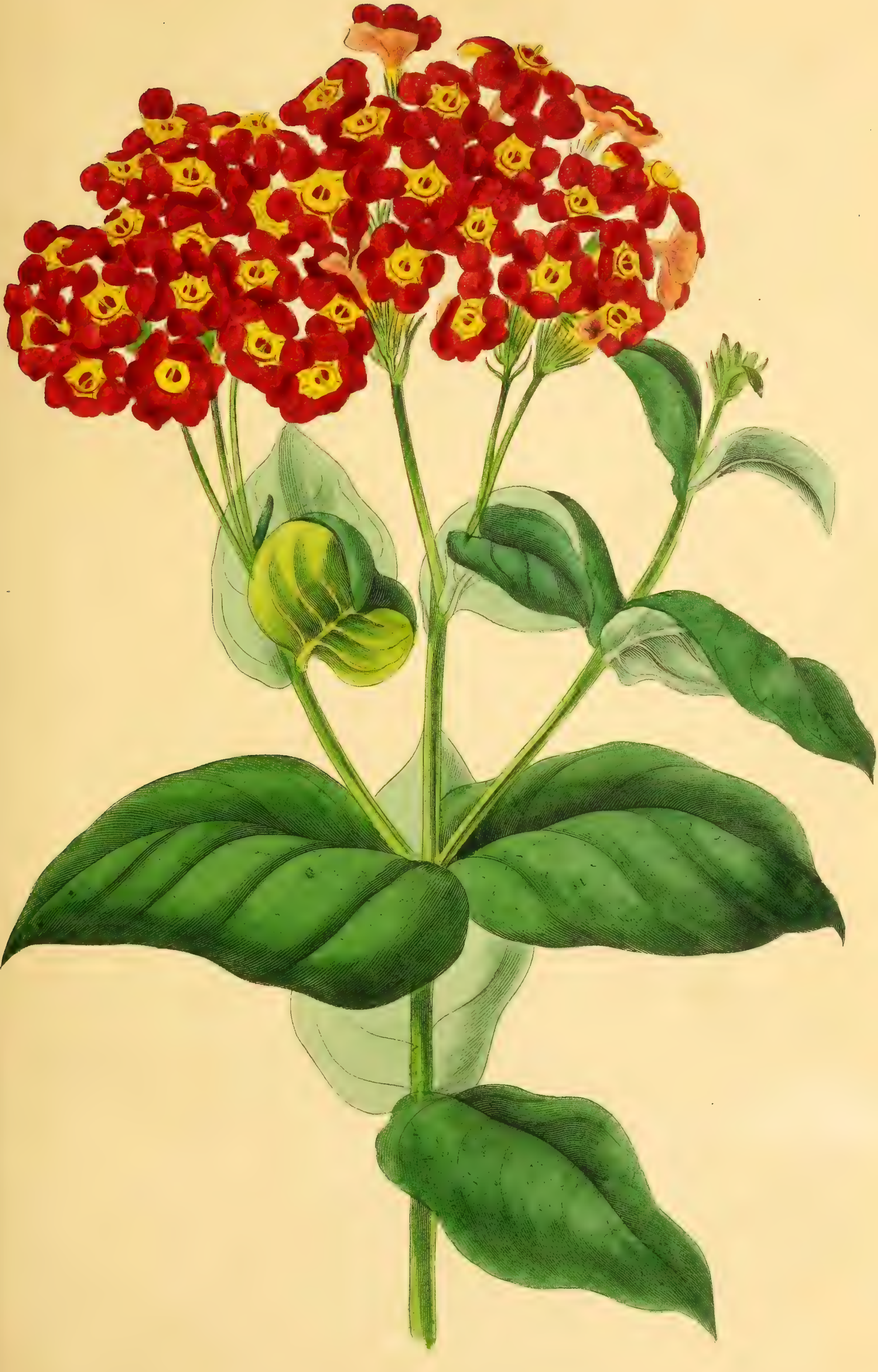
Specific Character.—*Plant* a compact, dwarf shrub. *Stems* smooth, erect, branching, yellow-green, slightly coloured with rose-colour when young, afterwards becoming red, and finally, when the wood is old, of a reddish brown. *Leaves* obcordate, that is, betwixt oblong and heart-shaped, acute, opposite, dark glossy green on the upper side, paler, and often slightly tinged with red, on the under. *Flowers* terminal, in corymbs, very showy. *Calyx* five-parted, segments acute, yellowish-green, tinged with red. *Corolla* tube three times the length of the calyx, rose-coloured; limb five, and occasionally six-parted, lobes rounded, very rich orange red, darkest at the extreme edges, and becoming lighter towards the centre of the flower; centre of the flower, bright orange yellow; eye, dark crimson.

According to Messrs. Loddiges, this brilliant plant is a native of the Havannah, whence it was received at Hackney through the kindness of their friend, W. J. Mac Leay, Esq., in 1830, and has since flowered in the stove beautifully.

The flowers are exceedingly rich in colour, and make a most striking appearance, being quite as splendid as *Ixora coccinea*, if not more so.

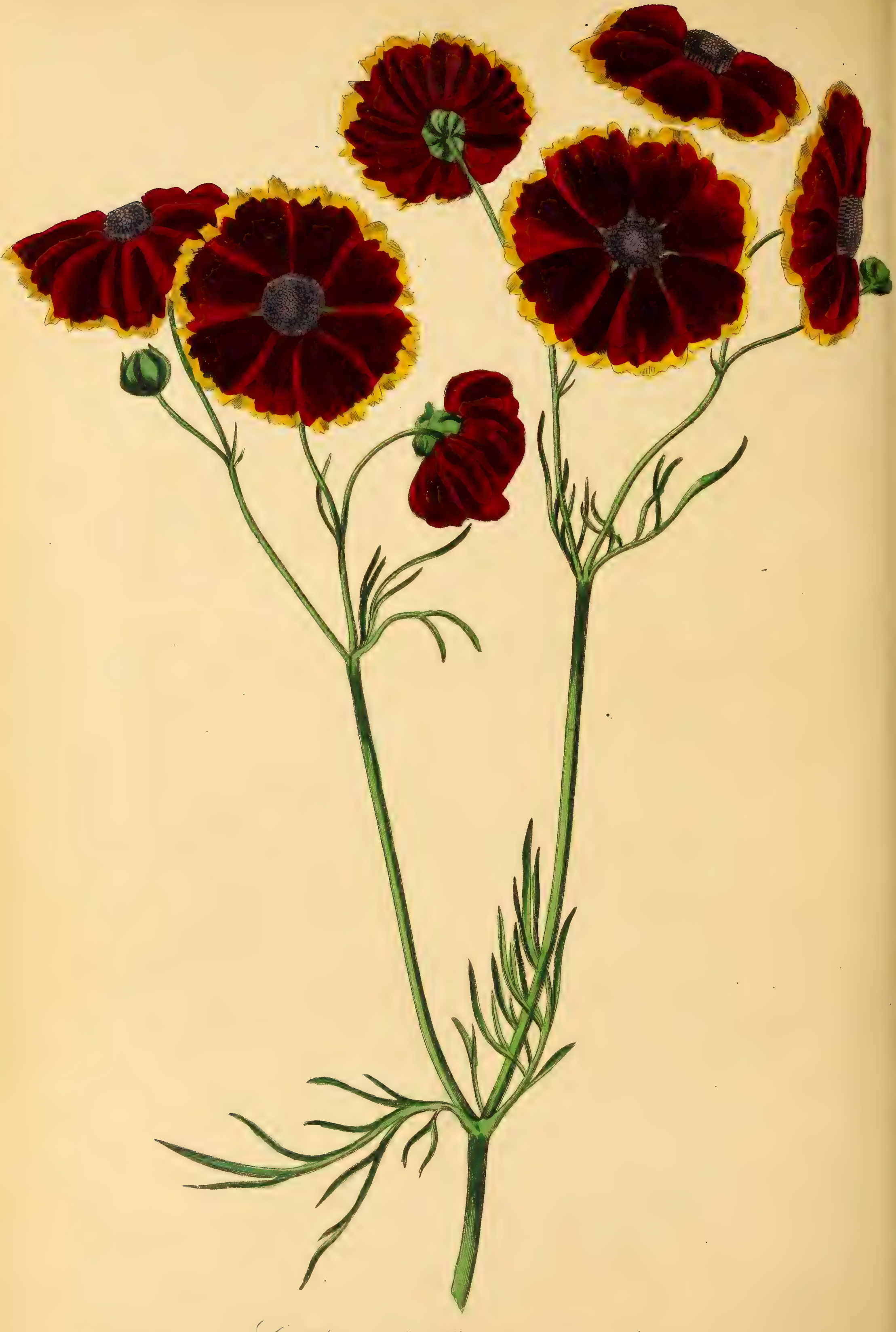
It requires the stove, and should be potted in loam and peat, and may be increased by cuttings. For further particulars on culture, propagation, &c., see vol. 1, page 150.

The generic name is given in honour of a physician named Rondelet, and the specific name from the showy appearance of the plant when in flower.



F.W. Smith del et sc.

Rondeletia speciosa.



Calliopsis bicolor atrosanguinea.

DECR 1835

CALLIOPSIS BICOLOR ATROSANGUINEA.

(CRIMSON TWO-COLOURED CALLIOPSIS.)

CLASS.
SYNGENESIA.

ORDER.
FRUSTRANEA.

NATURAL ORDER.
COMPOSITÆ.

GENERIC CHARACTER.—*Involucrum* double, many leaved. *Receptacle* chaffy. *Down* two-horned.

SPECIFIC CHARACTER.—Annual. *Stem* from two feet six to three feet, branching, smooth, yellowish green. *Leaves* pinnate and bipinnate, opposite, entire. *Involucre* outer leaves short, inner larger and coloured. *Rays* orange yellow, velvety brown at the base, lacerated at the extremity. *Florets* small, orange yellow, becoming lighter towards the base, upper part purple.

VARIETY ATROSANGUINEA.—Annual. *Rays* of the flower, dark crimson, sometimes bordered with yellow, fringed and lacerated. *Florets* purple.

SYNONYMS.—Calliopsis sanguinea. Coreopsis tinctoria atrosanguinea. Coreopsis sanguinea.

THIS new and beautiful annual makes equally as fine a show on the borders as the *C. bicolor.* Where it was raised, or, if introduced, by whom and when we cannot tell. Mr. Thomas Bailey furnished us with the figure from his Grace the Duke of Devonshire's garden, at Chiswick, and he states that he received it from Mr. Knight, King's Road, under the name of *Calliopsis sanguinea.*

The flowers are liable to vary, some being entirely of that fine deep blood colour, which composes the centre of the old *C. bicolor* (*Coreopsis tinctoria*), and others have a very narrow margin of rich yellow.

It is perfectly hardy, and, like the *C. bicolor,* requires the most simple culture, the seeds merely requiring to be sown in the open border, and the plants kept free from weeds. Common light loam suits it very well.

The generic name is derived from the Greek word *kallistos,* most beautiful, and *opsis,* eye, or most beautiful to the eye, alluding to the splendid show made by the flowers when expanded. The specific *bicolor* is given from the two very distinct colours of the flowers.

ON THE CONSTRUCTION AND HEATING OF HOT-HOUSES,

WITH A REMARK OR TWO ON THE PROBABLE COST OF THEIR ERECTION.

Every person about to erect a hot-house, has, previous to the work being entered upon, to consider well four subjects, viz:—

First, The purpose for which the intended house is to be used, which will determine the situation and aspect.

Secondly, The principle on which it shall be built; this includes the form of the house, the mode of heating, and the manner of ventilation.

Thirdly, The probable cost of erection, and the best means of doing it as reasonably as possible. And,

Fourthly, The season when it will require the most light, which will determine the angle, or slope of the roof.

First.—With regard to the purpose for which the intended house is to be used, the following things are necessary to be known:—

If the house is intended for early forcing, the products are wanted at a season when there is little sun, the situation should be warm and sheltered; the foundation perfectly dry, and, if not so naturally, made so by good drainage; the aspect due south, and the roof fully exposed to the rays of the sun, without interruption from sunrise to sunset.

If the house is intended for the general growth of stove-plants, a south aspect is indispensable to grow the plants to perfection.

If for Orchidea, either south, south-east, or east will do; indeed these plants will grow in almost any aspect, if they can be supplied with the requisite proportions of light, shade, heat, and moisture.

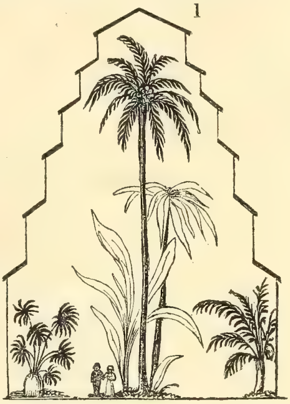
If for a greenhouse or conservatory, a south aspect is preferable, but south-east or south-west answers very well, and even due east, but in the last case, the plants grown must be all hard-wooded, as Clethras, Camellias, Oranges, &c., for all soft-wooded plants invariably grow very weakly in such places.

If for an orangery, an eastern aspect answers well, and we have seen oranges thrive well on a western, but a south-east or east is to be preferred.

In all the above situations it is indispensable that the foundation be well drained, as any stagnant water will be pernicious, and partially, if not wholly, defeat the purpose intended in the erection.

Secondly.—The principle on which it shall be built:—Of the first part of this (the form of the house) little can be definitely said. The form will depend much upon the situation in which it is built, the structure of the surrounding buildings, the taste of the proprietor, and many other circumstances, which must be decided by the person entrusted to accomplish the work. See our observations, pages 80, 81.

A correspondent to the *Horticultural Register* suggested the idea of constructing a stove or conservatory, so that a less quantity of glass would be required, and that better secured from the effects of hail. (see fig. 1.) All the perpendicular parts to be glass, the others to be covered with slate. The advantage would be, the great height to which it might be carried, for a little money, enabling us to walk under groves of palm-trees, 70 feet high; and ponds might be formed and heated to any degree required, in which Nymphæas and other aquatics could be grown, surrounded by gold and silver fish. The disadvantages are these: 1st, it would be very inferior in appearance to those wholly composed of glass, and 2nd, its peculiar construction would allow the wind to have very great power upon it.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On the mode of heating, something may be said more to the point, although in this case the taste and judgment of the person appointed to superintend must be used. There are three ways of heating hot-houses, viz.:—by fire flues, by hot water, and by steam. For ordinary purposes, the first, if properly constructed, are undoubtedly the best; for plant-stoves, where a constant fire is necessary throughout the year, a hot-water apparatus on a good principle is excellent; and for particular purposes, steam answers well.

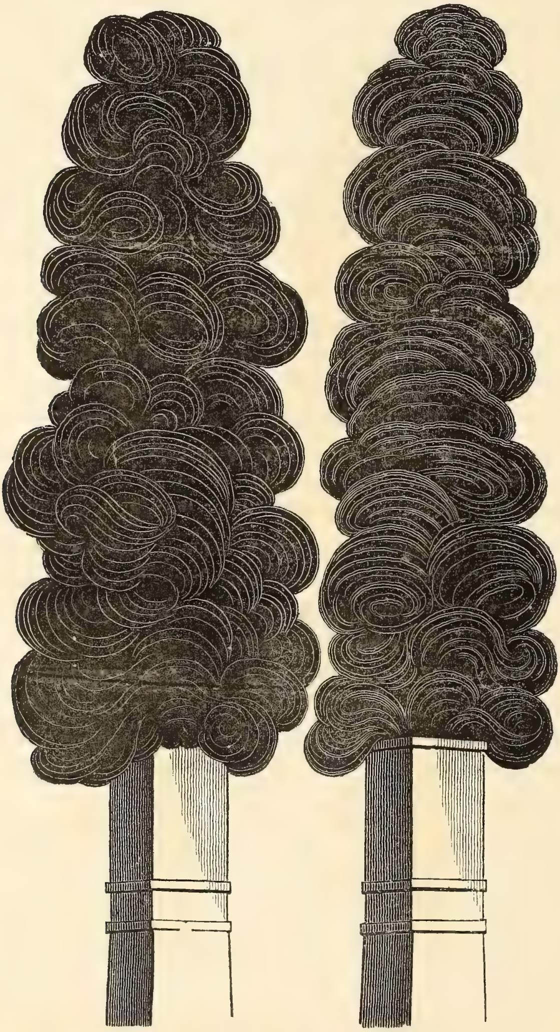
But neither of the two last modes can be applied to general purposes like the first, and this for two reasons, viz.:—because many houses are not forced at all throughout the year, and therefore require very little fire, and what little they have is merely at a time of excessive wet, or severe frost, to prevent the plants damping off with the effects of the first, and from being frozen by the latter. For the first of these evils, neither hot water or steam would answer well; for the latter, both would do, but for another objection, and that is the expense. The expense of either a steam or hot-water apparatus is so great when compared with that of common smoke-flues, that in a house where little fire was required, the extra expense would be in a great measure thrown away.

In all cases, it is indispensable that the flues be made secure by good flue covers, and the workmanship done in a proper manner; for any escape of smoke will invariably injure, if not destroy, the plants exposed to its influence.

For all houses requiring little fire, we recommend the use of the common furnaces, which may have a bit of fire put in at any time in a few minutes, and be put out again quickly, if required; but, if much heat is wanted, and that for a long time, we would say use Chanter's Patent Smoke-burning Furnace, which will give a great heat without subjecting the proprietor to the usual nuisance, SMOKE.

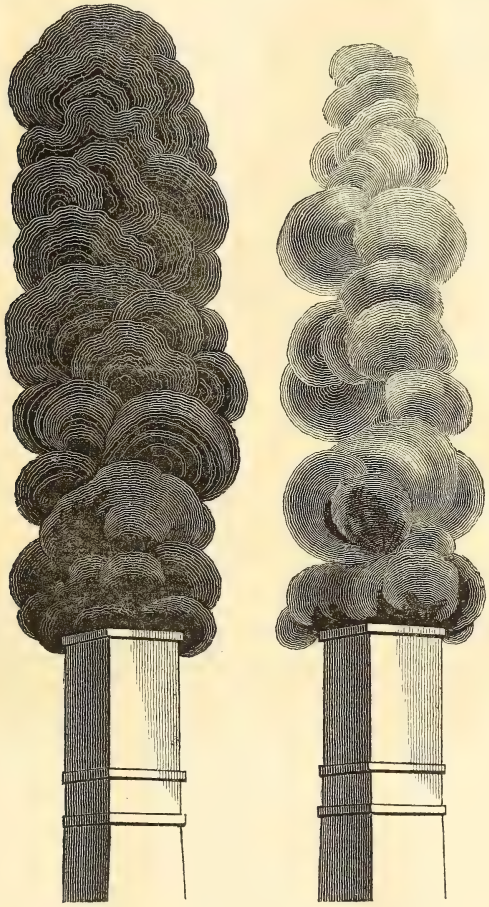
The prevention of smoke from furnaces, in towns and manufactories, has for ages past been a desideratum with the British public, and the attention of the legislature has for some time been directed to this desirable object. It was, no doubt, the principle of combustion laid down by Scheele, Priestley, Lavoisier, and Cavendish, that led to the practice of throwing an excess of atmospheric air into the furnace, to produce this effect; but it has always been attended with a great increase of fuel, and still remains but partial and very imperfect.

2



In all the common methods of burning coal, a variety of gases, both inflammable and non-inflammable*, are liberated or formed; and it is the mixing of the latter with carburetted hydrogen or coal-gas, which forms what is commonly called smoke, observed to rise so thick and dense from steam-engine and other furnace-chimneys; and the difficulty of consuming this smoke, after it is once formed, will appear obvious, since it has been proved by Sir H. Davy and others, that one-sixth part of nitrogen, or one-eighth part of carbonic acid gas (both products of combustion), added to an explosive mixture, will prevent the inflammation of the whole.

3



In order to do away with smoke entirely, and to render combustion more complete, Mr. Witty, civil engineer, constructed a peculiar furnace (figure 6), for which he obtained a patent; Messrs Chanter and Co. purchased the patent right, and made several important improvements; and as such it appeared in our *Magazine of Botany*, vol. 1, page 133. It is now further improved by the box and screw being removed, &c., and from what we have seen of its action by two furnaces erected at Chatsworth, we apprehend it will answer admirably; but of these we shall speak at a future time more fully.

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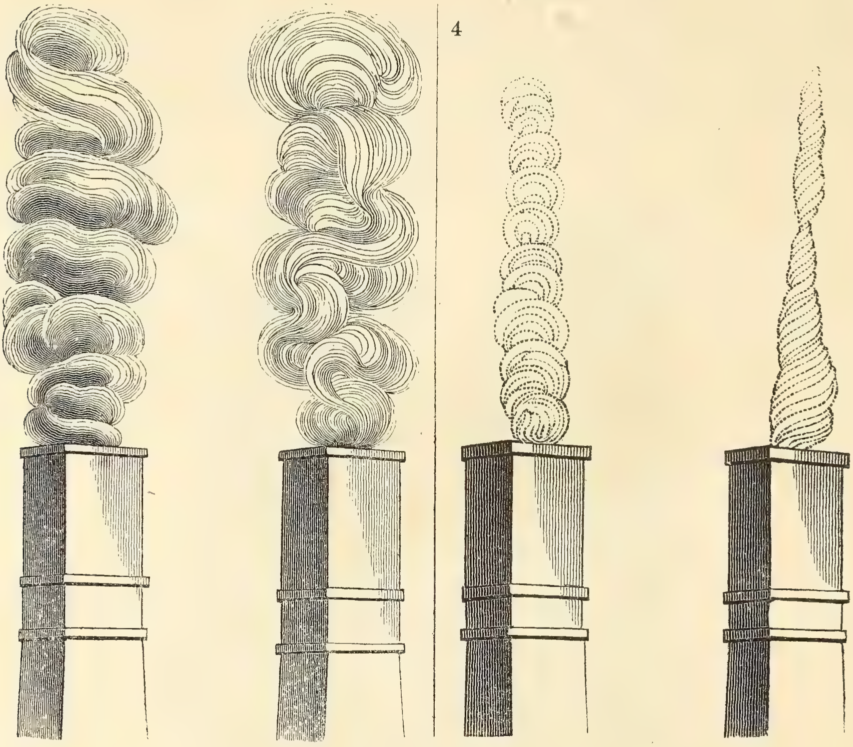
* Non-inflammable, except at a great heat.



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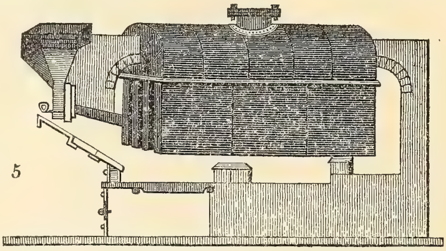

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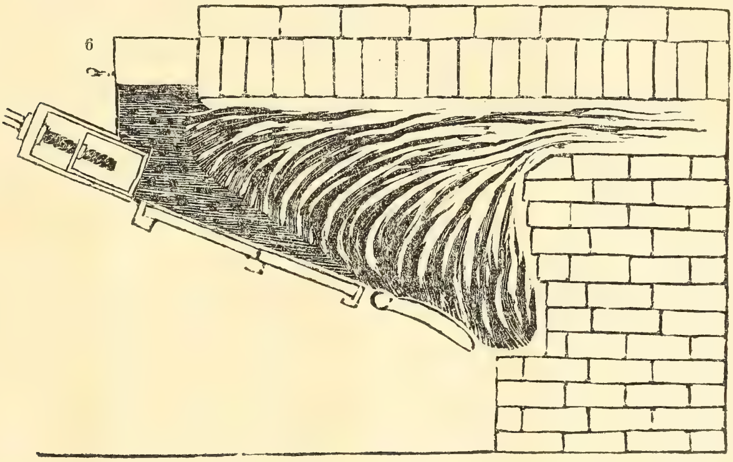
It will be seen in our previous description, vol. 1, page 133, that these furnaces are constructed so as to divide the consumption of coal into two distinct processes, viz., carbonisation and combustion. For this purpose there is a retort, and carbonising plate or distilling plane, added to the furnace grate and clinker door; so that the coals are first submitted to dry distillation, and then to combustion, the gas and coke being burnt together, and thus prepared before they reach the bars; thereby availing itself of the essential principles of combustion, by separating the gas from the coal, while the heated air, passing through the coke fire, and under a counter arch, sweeps over the fresh coal, and inflames all the gas as it is evolved.

Thus it is that the carbon, carburetted hydrogen, olefiant, and all other combustible gases from coal, are employed in producing heat without smoke (figure 4), while no residuum of a combustible nature is left unburnt.

In addition to this, Messrs. Chanter and Co. have invented a new patent boiler (5), not occupying more than half the usual space, with greater surface applicable to hot water apparatus of every description; by means of which, if united with the gas furnace, the same temperature is said to be retained *twelve* hours without attending to the fire, or any inconvenience arising from smoke or dust.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In combining the patent furnace with the hot water apparatus, a small additional charge is made for the patent. The apparatus can be introduced in various forms and designs, by large or small pipes, within ornamental figures, or any way the proprietor of the house pleases.

When the furnace is required to a boiler or to flues in use, very little expense or delay will be occasioned to fix it, as it requires no alteration in the flues, nor need the boiler be disturbed. Plans, designs, and further information may be obtained at the patentee's offices, St. Ann's Wharf, Earl-street, Blackfriars, London.

On heating by hot water we have previously inserted much information; we have here, however, added an extract from a paper on that subject, with illustrative figures, by Alexander Cruikshanks, Esq., read before the Horticultural Society, May 20, 1834, and inserted in their Transactions, vol. 1, page 513, N. S.

The writer suggested the mode of heating the water to a friend in France, who had built a small greenhouse in front of his dining-room, where there was no convenient place to erect the brickwork for a common boiler, nor any chimney into which a flue might be turned. It occurred to him that by having a small cylinder boiler constructed like those originally employed in the high pressure steam-engine, containing the furnace in a smaller cylinder within the first, and surrounded by the water, that no brickwork would be required; and that by burning a mixture of charcoal and cinders, the inconvenience of smoke would be avoided, and sufficient draught obtained by a moderate length of stove pipe passing through the roof. This plan was adopted, and answered completely.

Fig. 1.

Fig. 2.

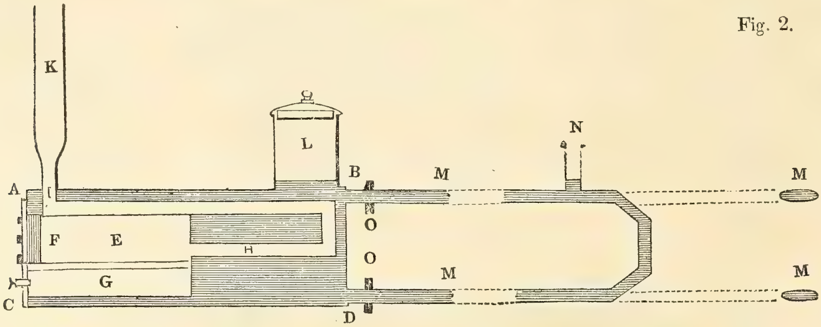
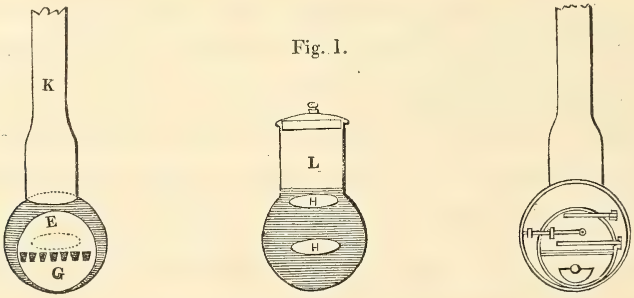


Fig. 1 is a vertical longitudinal section: A, B, C, D, the outer cylinder or boiler, three feet long and one foot in diameter; E the fire-place; F the door, lined with a mixture of fire clay and pumice-stone; G the ash-pit, furnished with a drawer of sheet iron.

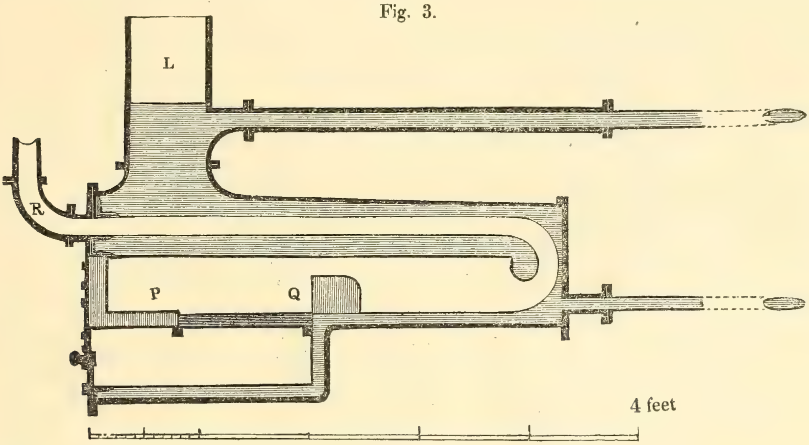
The fire-place and ash-pit are contained in the inner cylinder, which is half the length of the boiler, and nine inches in diameter. From the back of the fire-place, an elliptical flue, H, proceeds nearly to the end of the boiler, then returns again towards the front, and passes out at I into the chimney K. L is a cylinder for supplying the boiler with water, and allowing for its expansion when heated: M M, the water-pipes, (shown in section fig. 2,) connected with the boiler by screws or flanges at O O. These pipes are elliptical, which shape combines in some measure the strength of the circular with the extended surface of the flat form. The pipes are only twelve feet long; but the circulation is so rapid that the boiler would serve for a much greater length; N is an air-pipe.

Fig. 1.



This small apparatus has answered so well, and appears to offer so many advantages over a boiler set in brick-work, that the writer has been led to consider how the plan may be improved upon, and applied to heating houses of large dimensions with any sort of fuel. This might probably be accomplished by constructing the apparatus according to one or other of the plans of numbers 3 and 4, where the same general principle is followed as in that already described; but the boiler and the furnace are so formed that a smaller quantity of water is contained between them compared with the surface exposed to the heat from the fire, and the arrangement of the parts is better calculated to promote a rapid circulation of the water in the pipes. For this purpose the cylinder L, instead of being placed at the same end of the boiler as the pipes, is removed to the opposite end, and the upper end is connected with it; consequently the water enters from the lower pipe at one extremity of the boiler, passes through its whole length over the surfaces of the furnace and flue, becoming gradually heated in its passage, and then rises through the cylinder into the upper pipe, thus flowing in a constant and regular current through the whole apparatus.

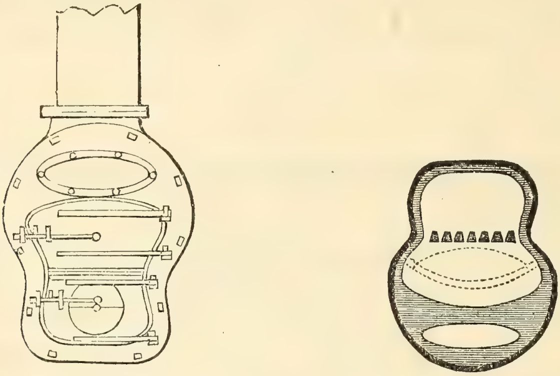
Fig. 3.



In figure 3, the front of the fire-place, where ignited fuel would be inconvenient, is occupied by a large fire-tile, P, on which a supply of fuel may be heated previous to its being pushed forward on the grate. Q is a bridge formed of fire clay in one piece, which may be removed when the flue requires cleaning. The flue, instead of passing through the top of the boiler, is brought out at the front, where it turns upwards, and is intended to be carried into a common chimney. Thus the furnace and flue being fixed only to the front, and unconnected with any other part of the boiler, the whole may be removed in a few minutes, should any repair be necessary.

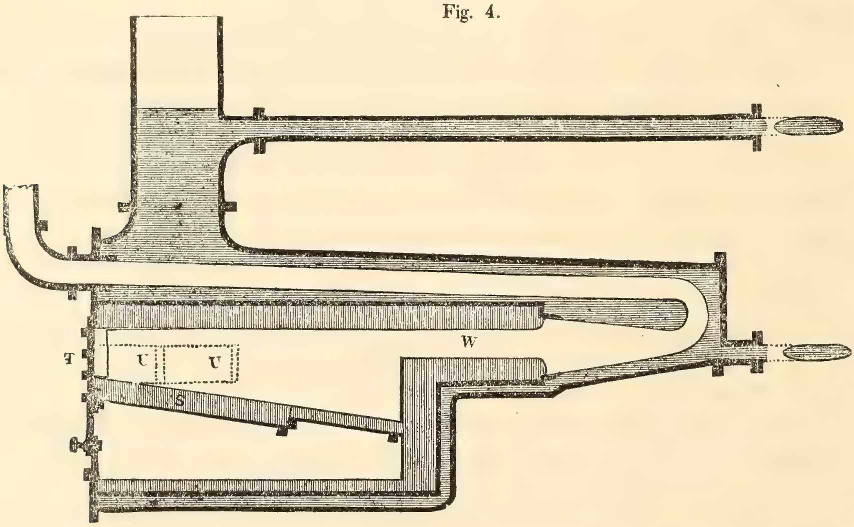
The furnace in figure 3, though well adapted for burning coke, cinders, or dry wood, would perhaps not answer well for coal, as the smoke would be so much chilled by contact with the metallic surface of the fire-place, that the flue would be liable to become foul. This might be prevented by constructing the furnace as in figure 4, lining it throughout with fire brick. S is an inclined plane of fire-tiles, on which the fuel is to be spread when first put into the furnace. At T T are air passages, between the fire bricks and the case of the furnace, leading from the front, and having openings, U U, into the fire-place at the joints of the bricks above the inclined plane. A regulated supply of air being admitted through these openings would mix with the vapours rising from the coal, and in a great measure effect the combustion of the smoke in passing over the fire, and through the heated passage W. The boiler should be placed within the house, either under the plant stage or in a pit sunk below the level of the floor; the end only being built into an opening in the wall, for the purpose of supplying the fire with fuel from the back sheds.

Fig. 3.



Mr. Cruikshanks seems confident that on this principle a much greater proportion of the heat generated by the combustion of the fuel may be communicated to the atmosphere of the house, and that with less loss of time than by any of the methods now in use. The flue or flues surrounded with water may, doubtless, be constructed in such a manner that the heated air and vapours passing through them may be so far deprived of their caloric as to enter the chimney at a temperature little above that of the water; and beyond this point the economy of fuel cannot possibly be carried.

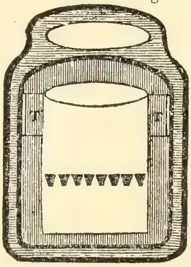
Fig. 4.



To limit the loss of heat by the chimney is of course a desideratum in any mode of warming buildings; but it appears to be overlooked in many of the plans proposed for the purpose, especially in those for employing oil and other fluids, at a temperature considerably above the boiling point of water. As the heated air and vapours must necessarily enter the chimney at a higher temperature than that of the fluid in the boiler, the loss of heat will be greater in proportion as that temperature is increased.

There is another circumstance connected with the plans alluded to that does not appear to be taken into consideration at all—the great capacity of water for heat, compared with most other fluids, oil for instance, or mercury. Water, it is well known, in being heated any number of degrees, absorbs twice as much caloric as an equal bulk of oil or mercury, and consequently a given bulk of water at 212 degrees, in cooling down to 60 degrees, that is, in losing 152 degrees of sensible heat, would warm the surrounding atmosphere as much as an equal bulk of oil or mercury would do in cooling from 364 degrees to 60, or in losing 304 degrees of sensible heat, as indicated by the thermometer. Such being the case, if oil or mercury, or almost any substance that can be named, could be compared in point of economy safety and cleanliness as a material, with water at or under the boiling point, still it would be inferior to water in point of economy as regards the consumption of fuel.

Fig. 4.



The apparatus represented by the figures 1 and 2 is constructed of copper, and costs about 9*l.*; a house thirty feet in length would not cost 13*l.* In the plans 3 and 4 the outer case or boiler is supposed to be cast iron, as well as the case of the furnace in 4, and all the other parts in copper. The whole might be made of cast iron; but there would be a risk of its cracking in those parts exposed to the fire, an accident to be especially guarded against in heating horticultural buildings. Plate-iron or tin-plate might be employed, either wholly or in part; but cast iron and copper would perhaps be preferable materials. With respect to the pipes, when made of sheet-copper or zinc, or tin-plate, they are better calculated to disperse the heat than those of cast iron commonly used, which are perhaps, except in point of strength, the worst that can be employed; they expose a smaller surface, in proportion to the water they contain, than pipes of any other shape; and from the thickness of metal, never less than three-eighths of an inch, and frequently more, they oppose a direct obstacle to the ready transmission of the heat from the water to the surrounding atmosphere.

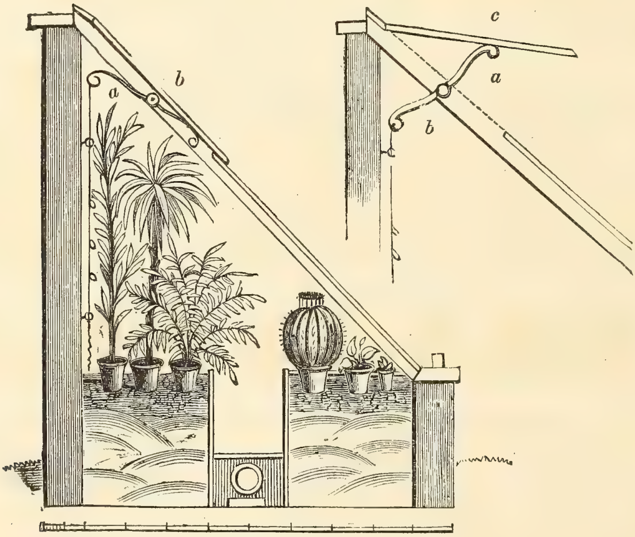
Thin sheet-copper is certainly far superior, and perhaps, in the end, the most economical. Zinc, though otherwise an excellent material, is not well suited for elliptical pipes; it becomes so soft at the temperature of boiling water that they soon, the lower ones especially, change their shape and become nearly round. If cast iron be preferred, there is no reason why the cylindrical form should be adhered to; and probably if elliptical pipes of different sizes, cast as thin as possible, were to be supplied from the foundries where those now in use are cast, they would soon supersede the use of the latter.

No reservoir is attached to the small apparatus I have described; but on a large scale it would of course be necessary, the quantity of water being small, and there being no mass of brickwork to act as a reservoir of heat ; this purpose, however, is evidently much better answered by a cistern of water within the house, than by a boiler and brickwork, from which much heat is dissipated in the back shed ; but to prevent loss of time in applying the heat in severe weather, it should be so connected with pipes that the water in them may be sufficiently heated to warm the house before it is allowed to pass into the reservoir.

The ventilation is another subject that comes under this head. With respect to ornamental conservatories, or stoves of a peculiar construction, the modes of ventilating are various, and should always be such as will properly correspond with the form of the house.

In all ordinary forcing-houses, or greenhouses, air is admitted at the back and front, usually by sliding the lights. Our readers may remember that in vol. 1, page 130, we recommended ventilators in preference to sliding the back lights :—*first*, from the ease with which ventilators are opened—*secondly*, because when the lights are open, if a sudden shower of rain or snow falls, it is necessary to draw them up again with great speed, or much wet will be admitted, perhaps at a time when the cultivator was particularly anxious to keep his house dry,—and *thirdly*, because in severe and stormy weather air can be admitted by ventilators in the back wall (if the ventilators be properly constructed) when it could not be admitted safely any other way.

It is not, however, always convenient to have ventilators fixed in the back wall of a forcing, or greenhouse, nor can they be made to look altogether ornamental. On looking over a French work on gardening, called the " Manuel du Jardinier," written by M. Noisette, in five vols., we observed a very simple way of elevating the back lights (see figures) to admit air : it is rather an old way, but we do not remember to have seen it figured in any work, either English or French, previously to this.



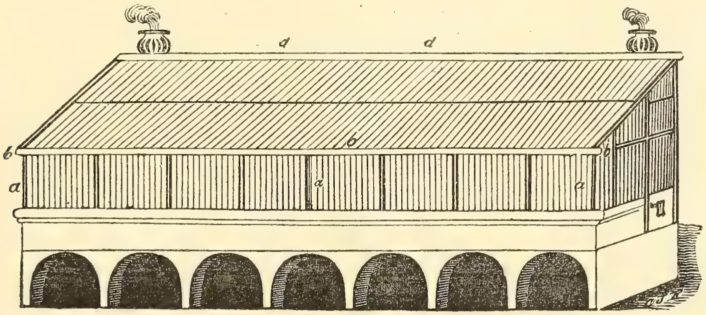
It consists of a bar of iron made in shape as shown in the annexed figures *a a*, or in any other ornamental shape that may please the proprietor. This iron swings on a pivot fixed in the rafter, as *b b*.

The upper sashes of the roof are of course made light, so that they can be easily raised, as *c*. On that part of the light where the bar works, is fixed a plate of thin iron, *c*, of breadth and length enough to prevent the bar from coming in contact with the wood of the sash, and which being oiled would allow the bar to slide easily.

Attached to the end of the bar is a cord or thin chain, which is either allowed to hang down to the back wall, or be fixed in any other way most convenient. If a cord is used, loops will be necessary, to catch upon hooks fixed in suitable places, so that when the light is open it may be kept in that position; if a chain be used the links will answer the purpose.

This system has, however, its disadvantages. First, the elevation of the lights would admit the air in too abruptly, which, if cold or frosty, might injure the plants; and secondly, in times of high winds no air could safely be given, or it would be liable to lift up the lights and break them; neither of which objections can be raised against sliding the lights.

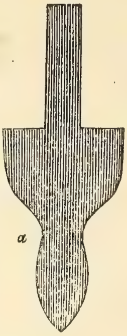
Thirdly. The probable cost of erection. Some idea may be formed of the cost of erecting a wooden house, by calculating according to the prices named vol. 2, page 84, and vol. 1, page 130. And a little on the cost of one constructed of metal may be gathered from a paper on the subject in the Horticultural Register, vol. 2, page 105, which was furnished by Mr. Waldron, a gardener of considerable experience. The principal cause of metal houses not answering, he attributes chiefly to their bad construction, being often built by persons totally unacquainted with the advantages or disadvantages vegetation derives from certain modes of construction.

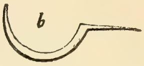


The house of which the annexed plan is intended to give an idea, contains 12,000 and upwards of cubic feet.

The aspect to be recommended for a house of this kind used for fruit, is to receive the full sun at eleven o'clock in the day; and be so situated as to have the sunshine from four o'clock in the morning to eight o'clock in the evening.

The uprights in front, *a*, are three inches wide and half an inch thick, set in stone; each sash swings open with a pivot: the spout, *b*, is four inches wide, and rests upon the uprights of the front sashes, fastening to them with screws. The astragals or sash bars, *a*, should be the size and weight of one pound to a foot, and screwed at one end to the spout, and the other to the stone coping at the top, *d*. The rafters are four inches wide, and half an inch thick: the lights in front all swing open: there is also a light over each door, to slide or swing, and three slides of wood in the back wall, within six inches of the top, to let off the vapours when necessary. The roof is all fast, and the air is admitted through the back, front, and ends of the house.





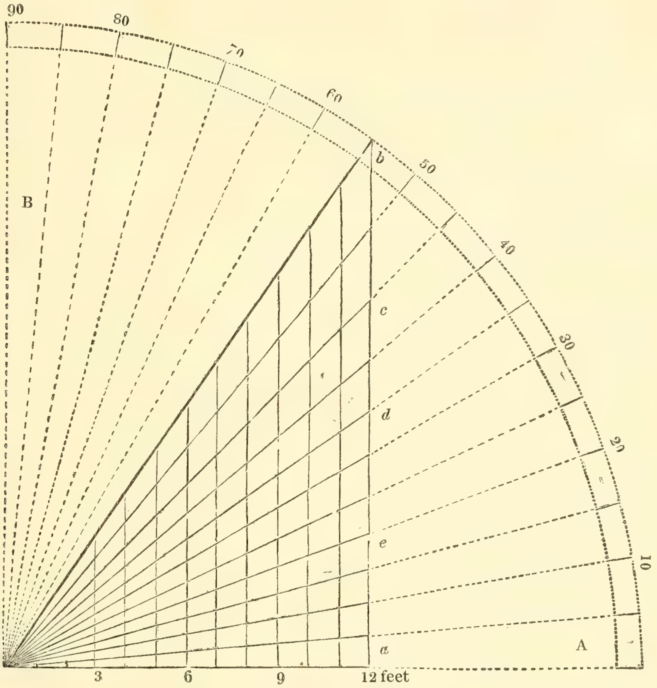
PROBABLE EXPENSES OF ERECTION, &c.

	£	s.	d.
Price of Glass, 1,100 feet of thirds, 6 by 4, at 7½*d*. per foot	34	7	6
Putty, 5 cwt., at 18*s*. per cwt.	4	10	0
Labour	4	0	0
Astragals or Sash-bars, 15½ cwt., at 12*s*.	9	6	0
Nine Uprights in front, 2 cwt., at 10*s*. per cwt.	1	0	0
Two End-rafters, 3 cwt., at 10*s*.	1	10	0
Thirty feet of Spouting, 3 cwt., at 10*s*.	1	10	0
Thirty feet of cross-pieces to support the Astragals, 2 cwt., at 10*s*. per cwt.	1	0	0
Three Uprights for ditto, 2¼ cwt., at 10*s*.	1	2	6
Eight front Sashes, 2½ cwt., at 12*s*.	1	10	0
Ninety feet of Stone Coping, at 6*d*. per foot	2	5	0
13,656 Bricks, Labour, Lime, &c.	42	15	0
Wood Work for Doors and Frames	3	0	0
Three Slides to admit air through the back-wall	0	12	0
Screws, Labour, fixing Astragals, &c.	4	0	0
Three stones of Stone-coloured Paint	5	10	0
Whole cost of the erection, independent of the heating apparatus	£117	13	0

Fourthly, The season when the most light will be required, which determines the angle or slope of the roof.

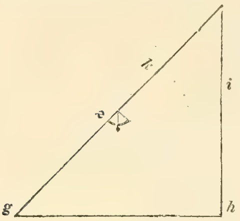
In all houses for plants, as much light and sunshine is required as possible during the winter months; when, therefore, they are built in the ordinary form, it is always advisable to have front upright sashes, to catch the rays of the sun from November to February, and a sloping roof for spring, summer, and autumn. If there are no front sashes, the angle of the roof should be constructed somewhat differently.

On looking over a popular French work on gardening, it would appear that the gardeners there calculate the inclinations or angles of their houses from the base or horizontal line of the quadrant, and not from the perpendicular, as the English gardener. Both systems are equally good when understood: but an understanding is requisite, because an angle of 70 degrees, which with us is well known to be a very flat roof, is with the French very steep, and the same slope as our 70, on their system, is an angle of 20 degrees; likewise an angle of 15 degrees, which in our calculation is very steep, only fit for early peach houses, and other fruit houses, where the trees are trained to the back wall, is by the French calculation very flat and unfit for early forcing. See the angle of 15 in the annexed scale.



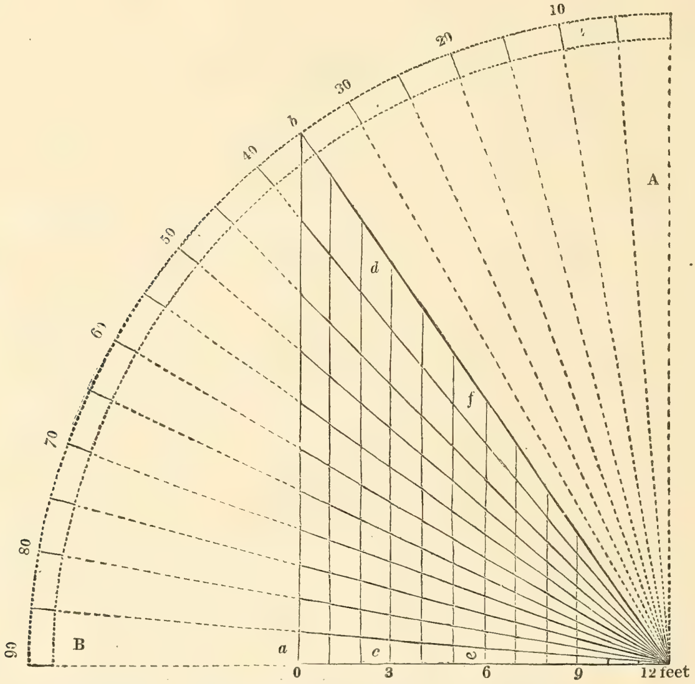
An example or two will probably explain the subject better than words. Supposing a house for early forcing was required to be built, 12 feet wide, and the roof to form an angle of 55 degrees. Now to accomplish this, it would be necessary to raise the back wall as much as 17 feet higher than the front, as *a b*. Again, a house of the same dimensions, with an angle of 45 degrees, the back wall would require to be 12 feet higher, as *a c*. With an angle of 35, only 8 feet, 4 inches higher than the front, *a d*. With an angle of 20, only 4 feet, 4 inches higher, *a e*. With an angle of 10, which is the usual slope of frames, only 2 feet, 2 inches.

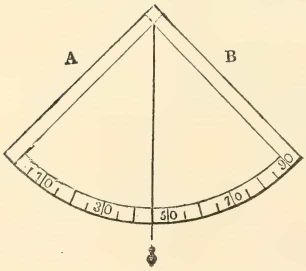
Of course, houses of less width require less elevation at the back, to give the required angle; for instance, a house 6 feet, with a roof at an angle of 45 degrees, will only need the back wall to be 6 feet higher than the front. Also a frame, 3 feet wide, having an angle of 10 degrees, would only require the back to be 7 inches higher than the front.



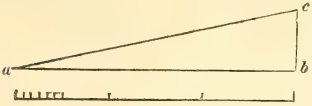
It will always be useful to remember that a perpendicular equal to the width of the house always gives an angle of 45 degrees. Say *g h* is the width of the house, the perpendicular line or back wall, *i*, is equal in height to the width of the base, *g h*, which gives the angle of the roof, *k*, 45 degrees.

The English gardeners calculate inclinations from the perpendicular, which in drawing plans for building may be explained by the annexed scale, wherein the side, B, of the quadrant is made the base instead of A, which of course reverses the whole order of calculation, making the first inclination 85 instead of 5. Supposing it is desired to build a house 12 feet wide, with the angle of the roof 35 degrees, the elevation of the back wall must be precisely the same as in the French scale is required for 55, viz.,—17 feet higher at the back than the front, as *a b*; the same angle, 9 feet wide, the back 12 feet eight inches higher than the front, as *c d*; if only 6 feet wide, the back need only be 8 feet 6 inches higher than the front, as *e f*; and so on in proportion, measuring according to the annexed scale.





It will also be seen, that by this scale, 80 degrees is the common angle of a frame, and exactly corresponds with 10 degrees on the other mode of calculation; and, therefore, of course requires the same elevation, viz.,—7 inches at the back more than the front. For instance, say *a b* is the side of a frame, three feet wide, to obtain an angle of 80 degrees, elevate it behind 7 inches, as at *c*, and the required angle is obtained.



To find the angle of the roof of any hot-house, it is merely necessary to place the side A of the quadrant in a parallel line against the side of the roof, as *z* for our way of calculation, and the side B for that of the French, and the plumb-line, hanging perpendicularly, will immediately give the required angle.

To ascertain on what angle the roof of a house should be constructed, it is only necessary to know when the house will require the most light; which, if a fruit-house, will be at the time the fruit is wanted to ripen, but if a plant-house, always in the depth of winter. It is a maxim adopted by T. A. Knight, Esq., to always give such a slope of roof as shall be at right angles to the sun's rays at the season when the fruit is wanted to ripen. Front sashes, however, render this rule not altogether necessary, as much light and sun is admitted through the front sashes in winter, and a somewhat flatter roof, than would otherwise answer, will do well for summer.

All houses with plain roofs, and without front sashes, if they are wanted to produce fruit very early, will require a roof so steep that the sun's rays will fall perpendicularly on it early in the season; but, if the house is made with front sashes, a roof about 60 or 65 degrees will do very well.

All plant-houses should have front sashes, as a very steep roof is both unsightly and inconvenient for plants.

An angled roof, like that of our large green-house at Chatsworth, figured page 81, may have a very flat roof, and yet admit a deal of light. I apprehend that a house built on this principle, would produce fruit earlier than any other; and it certainly answers well for plants.

NEW AND BEAUTIFUL PLANTS

FIGURED IN THE THREE LEADING BOTANICAL PERIODICALS, AND FLORISTS' MAGAZINE FOR SEPTEMBER.

Botanical Magazine. Edited by Dr. Hooker, each number containing eight figures; beautifully coloured 3*s.* 6*d.*, plain 3*s.*, and corresponding letter-press.

Botanical Register. Edited by Dr. Lindley, each number containing eight figures; beautifully coloured 4*s.*, plain 3*s.*, and corresponding letter-press.

British Flower Garden. Edited by Mr. David Don, each number containing four plates, beautifully coloured 3*s.*, plain 2*s.* 3*d.*

Florists' Magazine. Edited by Mr. F. W. Smith, each number containing four elegantly coloured plates, with occasionally two or more plants on each plate. Large Quarto 4*s.*, Octavo 2*s.* 6*d.* The letter-press is written in a pleasing manner, and the hints on culture appear pretty correct.

Of the above twenty-four monthly plates, we have only selected such plants as are new or very rare, and only such new ones as are handsome and deserve to be extensively cultivated. For descriptions and figures, reference must be made to the works themselves.

CLASS I.—PLANTS WITH TWO COTYLEDONES (DICOTYLEDONEÆ).

GESNERIA TRIBE (GESNERIEÆ).

Gesneria faucialis. Wide-mouthed *Gesneria.* Mr. Herbert considers this by far the finest of the genus, but he can only distinguish it by the size, brilliancy, and paucity of its flowers from *G. bulbosa,* though it eclipses it. It is equally hardy, and thrives in the greenhouse, if not damp, in winter. It is, no doubt, a native of Brazil, and is nearly related to *G. Selloi.* *Botanical Register*, 1785. At first sight we were struck with the resemblance betwixt this species and *G. Cooperi*, figured, vol. 1, page 224 of this work, but on subsequent examination we observe it differs in many respects from that species.

PEA TRIBE (LEGUMINOSÆ).

Kennedya Marryattæ. Mrs. Marryat's Kennedya. A beautiful greenhouse climber, obtained from Swan River; seeds sent home by Sir James Stirling. It flowers abundantly from April to July, producing a striking appearance with its numerous scarlet blossoms. It is propagated by cuttings. *Botanical Register*, 1790.

Cassia glandulosa. Glandular-leaved Cassia. A plant of considerable elegance of foliage, and bearing its copious yellow blossoms for at least nine months out of the twelve. It is a native of the West Indies, and therefore requires the heat of the stove, when it forms a shrub four or five feet high. *Botanical Magazine,* 3435.

HEATH TRIBE (ERICEÆ).

Arctostaphylos tomentosa. Downy Bearberry. A curious and very rare hardy evergreen shrub, native of rocky places on the west side of North America, from Puget's Sound in the north to California and the Mexican mountains in the south. It requires to be cultivated in peat and loam; and in a sheltered situation, when it flowers in March. *Botanical Register,* 1791. The flowers are white.

BILBERRY TRIBE (VACCINEÆ).

Vaccineum corymbosum. Many-flowered Whortleberry. A very abundant species of Whortleberry throughout almost the whole of North America, but subject, in its native country, as it would appear from the accounts of American authors, and undoubtedly, as cultivated in our gardens and our shrubberies, to much variation. It is well worthy of a place in the garden, being quite hardy, and bearing copious blossoms during the month of May. *Botanical Magazine*, 3433.

VACCINEUM PENNSYLVANICUM. Small Willow-leaved Whortleberry. This pretty plant is also very common in the Northern States of America, and in Canada, and bears a fruit which, according to American writers, is very much esteemed. *Botanical Magazine*, 3434.

SWALLOW-WORT TRIBE (ASCLEPIADEÆ).

CALOTROPIS PROCERA. Tall Calotropis. This plant was raised in the garden of Sir Charles Lemon, Bart., M. P., at Carclew, in June 1832, from seeds collected by Lieut. James Sulivan, R. N., at Porto Praya, St. Jago. In the note which accompanied the seed it is described as being a shrub, or small tree, growing from ten to twenty feet high, and flowering in clusters at the ends of the branches. It is deciduous, and requires the constant heat of the stove. The soil should be sandy loam and decayed vegetable earth. *Botanical Register*, 1792.

THE TRUMPET-FLOWER TRIBE (BIGNONIACEÆ)

CRESCENTIA CUJETE. Calabash Tree. This tree was cultivated by the Earl of Portland, in this country, so long ago as 1690. But it has not been known to flower, until lately, when a fine plant bloomed in the stove of C. Horsfall, Esq., at Liverpool. *Botanical Magazine*, 3430.

THE MALLOW TRIBE (MALVACEÆ).

SIDA INÆQUALIS. Oblique-leaved Sida. This plant forms a small slender shrub, is said to be a native of Brazil, and flowered freely, for the first time in this country, in the stove of the Royal Botanic Garden, Edinburgh. *Botanical Magazine*, 3436.

THE BORAGE TRIBE (BORAGINEÆ).

SYMPHYTUM OFFICINALE BOHEMICUM. Bohemian Comfrey. Among the several varieties of *Symphytum officinale*, this is certainly the most distinct, and the only one entitled to a place in the flower garden, for which its dwarf habit and copious crimson blossoms render it very suitable. Three varieties occur wild in this country, but this one appears to be peculiar to Bohemia. It will grow in almost any kind of soil, and is easily increased by dividing the roots. *Brit. Fl. Gard.*, 304.

THE VIOLET TRIBE (VIOLACEÆ).

PANSIES, CALLED LADY PEEL, AND NABOB. These were both raised by Mr. Hogg, of Paddington Green, and they flowered for the first time this summer. They both possess very good qualities. *Lady Peel* is a sweet flower. The three lower petals are pale straw-colour, margined with beautiful light blue; and the stripes on the two side petals are united into a spot, which is reckoned a very fine property. *Nabob* is also a beautiful flower, and makes a fine contrast with the other. The stripes in this one are not united into a spot; but they pass quite through the petal to the margin, and from the contrast there is no doubt that the cross of the *Lady Peel* with *Nabob* would form a beautiful flower. *Florists' Magazine,* No. 3.

CHICKWEED TRIBE (CARYOPHYLLEÆ).

PINKS, CALLED PRINCESS VICTORIA, AND SIR WALTER SCOTT. Both these choice new varieties may be obtained of the growers, or of Mr. Woodman, 25, Manor Place, Walworth. They were ready for delivery last October. *Princess Victoria* was raised by Mr. John Dalton, of Mitcham, and was judged worthy of the first prize for seedling pinks, at the East Surrey Floral and Horticultural Society's second show for the present year, which took place in the Town Hall of Croydon on the 21st of June. This is a beautifully formed flower, and well worthy a place in every collection. *Sir Walter Scott* was raised by William Stockwell, of Walworth Common. It is a fine variety, flowering freely, and attaining a large size. The lacings on the outer petals reach the external edge, but as they approach the centre they are bordered with white. *Flor. Mag.*, No. 3.

THE CAMELLIA TRIBE (TERNSTROMIACEÆ).

CAMELLIA JAPONICA DONCKLAARII. This is a variety of great beauty, with dark crimson variegated with white; it has been named in honour of M. Doncklaar, Curator of the Botanic Garden, Ghent, to whom it was presented by a gentleman from Canton. It has been imported and grown by Mr. Tate, of Sloane Street, Chelsea, from whom plants may be obtained. *Flor. Mag.*, No. 3.

PLANTS WITH COMPOUND FLOWERS (COMPOSITÆ).

DAHLIA SUPERFLUA LAVINIA. This is a beautiful and engaging flower, of a low growth, bearing numerous erect flowers, forming one of the most prominent features in a collection of Dahlias. The flower fills in the centre well, and the surrounding petals are broad, entire, and beautifully arranged, of a delicate white at the base, and beautifully pencilled with a brilliant purple on the tips and borders, extending nearly half through the petal. *Flor. Mag.*, No. 3.

CLASS II.—PLANTS WITH ONLY ONE COTYLEDON (MONOCOTYLEDONEÆ).

THE LILY TRIBE (LILIACEÆ).

ERYTHRONIUM GRANDIFLORUM. Large American Dogs'-tooth Violet. Of this extremely rare plant, a single bulb was received by the Horticultural Society, from North West America, eight or nine years ago: it has continued to grow slowly in a peat border, and at last put forth its beautiful flowers last May. It was discovered by Mr. Douglas. The flowers are yellow. *Bot. Reg.*, 1786.

ORCHIS TRIBE (ORCHIDEÆ).

ONCIDIUM LEMONIANUM. Sir Charles Lemon's Oncidium. This curious little epiphyte was among a collection imported from the Havannah in March last, by Captain Sutton of Flushing, near Falmouth, and by him presented to Sir Charles Lemon, Bart., M. P., in whose garden at Carclew it flowered in May. The leaves are upwards of three inches long, the scape grows about nine inches high, and bears about five pretty yellow flowers. *Botanical Register,* 1789.

A FEW WORDS MORE ON ORCHIDEOUS EPIPHYTES,

BY MR. D. BEATON,

GARDENER TO W. GORDON, ESQ., HAFFIELD, HEREFORDSHIRE.

THERE are only two points in my management differing from yours, on which I lay any stress, viz.—1st, I never allow young plants to have a day's rest till they attain a flowering size, or are otherwise well established, or, in other words, I keep up a constant stimulus ; and, 2nd, I never pot a young plant till it is two or more years old, or until it is well supplied with roots in a vigorous state of growth.

1st. I never did, nor never could purchase any of these plants, consequently I only in the first instance received the smallest bit of most of my plants, and I have succeeded far beyond my expectations. The last two winters I removed my larger plants from my regular Orchideæ house for wintering, and kept my smallest plants in a regular heat of from 70 to 80 degrees, and had a good crop of cucumbers to the bargain. I never water them overhead in the winter, but the house is kept moist.

2nd. With regard to the young plants, I take damp moss and press it into a firm ball, tying it round with copper wire, I then fasten the pseudo bulb or creeping stem to the outside of this ball, and never suffer a drop of water to fall on the bulb, &c., till it begins to emit roots, but the ball of moss is regularly kept moist.

The terrestrial species I treat in the same way as the Epiphytes until they are well rooted.

When the roots have taken thorough possession of the ball, add a little more moss, and place the ball in a small forked stick, that is, a fork occasioned by three boughs starting from the same point ; hang these forked sticks in any convenient place in the house, and the roots will soon monopolise moss and fork too.

Now is the best time for first planting in a pot, which will very easily be effected by placing the forked stick in the centre of the pot ; the length of stick below the fork should be long enough to hold up the ball of moss, roots, &c., just above the surface of the pot, then build up with your turf or any other material which may be supposed to answer the same purpose.

In a few instances I substituted the following composition, and I think with advantage, but my experience does not warrant me to recommend it yet.

Take equal quantities of peat earth and fresh cow-dung, mix them well together, and spread the composition in a dry shady place about one or two inches thick ;

when half dried cut it into small squares and dry them till they are as hard as possible, and they do to substitute for turfy peat.

I mean to make small pots for young Orchideæ of this composition which, if I find them answer, I mean to use instead of the forked sticks. I shall make the pots by putting one pot within another so as to leave an inch space betwixt them; this space I will fill with the composition, and, when it is half dry, withdraw the inner pot, and cut out longitudinal slices in the side of my composition pot, in order to let the roots come out and take their own course.

OPERATIONS IN THE FLOWER GARDEN FOR DECEMBER.

Aloysia citriodora Plants growing in the open border should be sheltered with a mat, and have a little old tan, or half rotted dung, placed about the roots, if the weather is very severe. See vol. 1, page 157.

Alstrœmerias of various kinds, planted in the open borders, must now be sheltered from excessive wet and frost, by turning a garden pot over them. Those in pots, now in a state of torpidity, must have no water. See vol. 1, page 199.

Anomatheca cruenta.—If in the open border, shelter them with a pot filled with sawdust. About the end of the month, those in pots will require to be replanted; treat them as recommended vol. 1, page 103.

Anemones now planted, will flower about the end of May. Page 17.

Bulbs of various kinds for forcing, as hyacinths, &c. &c. should now be regularly introduced. Vol. 1, page 41.

Cacti at this time of the year are very impatient of water; be careful therefore, to set them in an airy place, and give them no water at all. Vol. 1, page 49.

Ericas must now have plenty of air on fine days and the house kept as dry as possible; also, in watering the plants, be careful that no water fall on the leaves. For particulars of culture, see vol. 1, page 236.

Fumigation.—If the plants are infested by the Aphis, during this month, immediate recourse should be had to fumigation with tobacco, as, from the torpid state of the plants, they would soon do great injury.

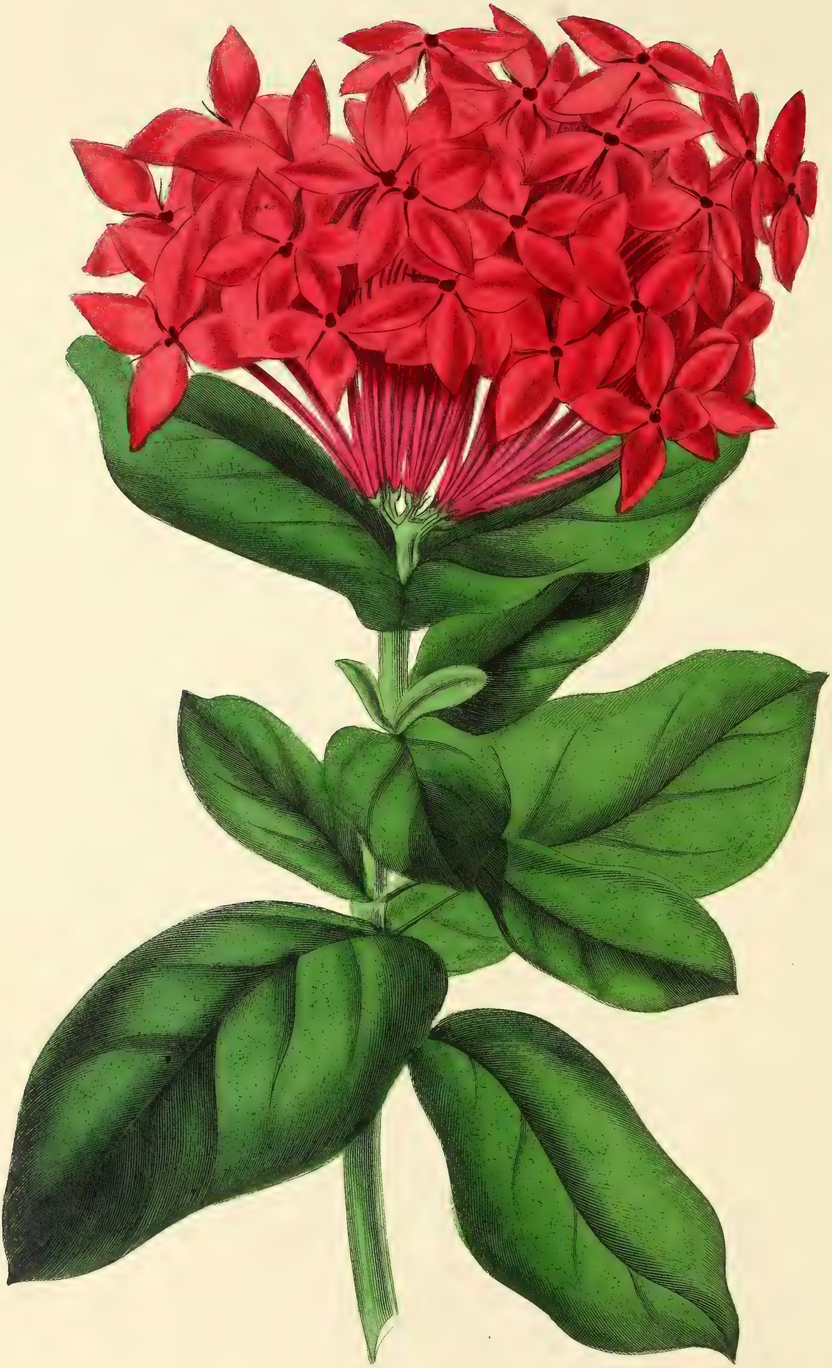
Gloriosa superba.—About the end of the month, repot the roots, and afterwards plunge the pots in a bark bed where they will receive about eighty degrees of heat, and water them sparingly. Vol. 1, page 97.

Primula prænitens will now be in full flower; be careful the plants are not overwatered, and allow them to have as much air as the weather will admit. Vol. 1, page 181.

Succulent Plants of all kinds must have very little water. Vol. 2, page 53.

Trevirana coccinea will now have died down; let them have no water until they begin to grow again, which will be in February. For particulars, see vol. 1, page 169.

Rhodochiton volubile and Lophospermum erubescens out of doors, must be sheltered by a flower pot, from the effects of frost, rain, &c. Page 27.



F.W. Smith, del et sc.

Ixora Bandhuca.

IXORA BANDHUCA.

(BANDHOOKA IXORA.)

CLASS.
TETRANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
RUBIACEÆ.

Generic Character.—*Calyx* four-parted. *Corolla* monopetalous, funnel-shaped, limbs cut into four segments. *Stamens* four, above the throat. *Berry* four-seeded.

Specific Character.—A bushy shrub; *branches* numerous; whilst young, smooth and bright green; when old, rather rough and of a dull brown. *Leaves* oblong, blunt, smooth, and shining, opposite, having short footstalks, but appearing to clasp the stem. *Flowers* numerous, in corymbs, terminal. *Calyx* rather purple-coloured. *Corolla* scarlet at first, and afterwards becoming darker until it is deep crimson; *tube* slender, more than twice as long as the expanded limb; *segments* of the limb elliptic-ovate, spreading. *Berry* purple; little larger than a garden pea.

For the figure of this highly ornamental plant we are indebted to the kindness of Messrs. Loddiges. It is a native of Hindoostan, from whence it was introduced to this country by Sir Abraham Hume, about the year 1812.

In its native country it is said to form a good sized bush, which at the season of flowering makes a splendid show; indeed, in this country, when the plant is well grown, the corymbs of flowers are large, and the petals well expanded; the richness of the crimson colour being contrasted with the bright green of the leaves, together with the dwarf habits of the plant, the whole forms a spectacle scarcely surpassed for splendour by any of the other inmates of our stoves.

It requires to be constantly kept in a damp stove, with much of the same temperature as for *Orchideæ*. The plant is very liable to be infested with Aphides at the extremities of the branches; therefore, if the shoots do not appear to grow freely, examine the young leaves, and if covered with insects clean them off with a sponge and clean water. Syringe over head three times a week in dry weather during summer, but in winter be careful that the leaves are kept dry.

The soil best suited for its growth is a mixture of sandy heath mould, loam, and well rotted dung, about equal quantities.

Cuttings of the half-ripened wood strike very freely, if planted in pots of sand, plunged in a brisk moist heat, and covered with a bell-glass.

CALCEOLARIA HOPEANA.

(MR. HOPE'S SLIPPER-WORT.)

CLASS.
DIANDRIA.

ORDER.
MONOGYNIA.

SCROPHULARINÆ.

GENERIC CHARACTER.—*Calyx* four-parted. *Corolla* two-lipped, inflated. *Capsule* four-valved.

HYBRID HOPEANA.—Perennial. *Stem* a foot or more high, clothed with pubescence. *Leaves* broadly ovate-oblong, stalked, wrinkled, and veiny, unequally toothed, hairy, large, six inches long, and three or four broad. *Flowers* numerous, corymbose, pendulous. *Flower-stalks* slender, an inch and a half long. *Calyx* segments green, ovate, acute, rather reflexed. *Corolla*, bright yellow, two-lipped; upper lip short, shaped like a helmet; lower lip large, much inflated, with three to five ribs, spotted and striped with dark red inside the mouth.

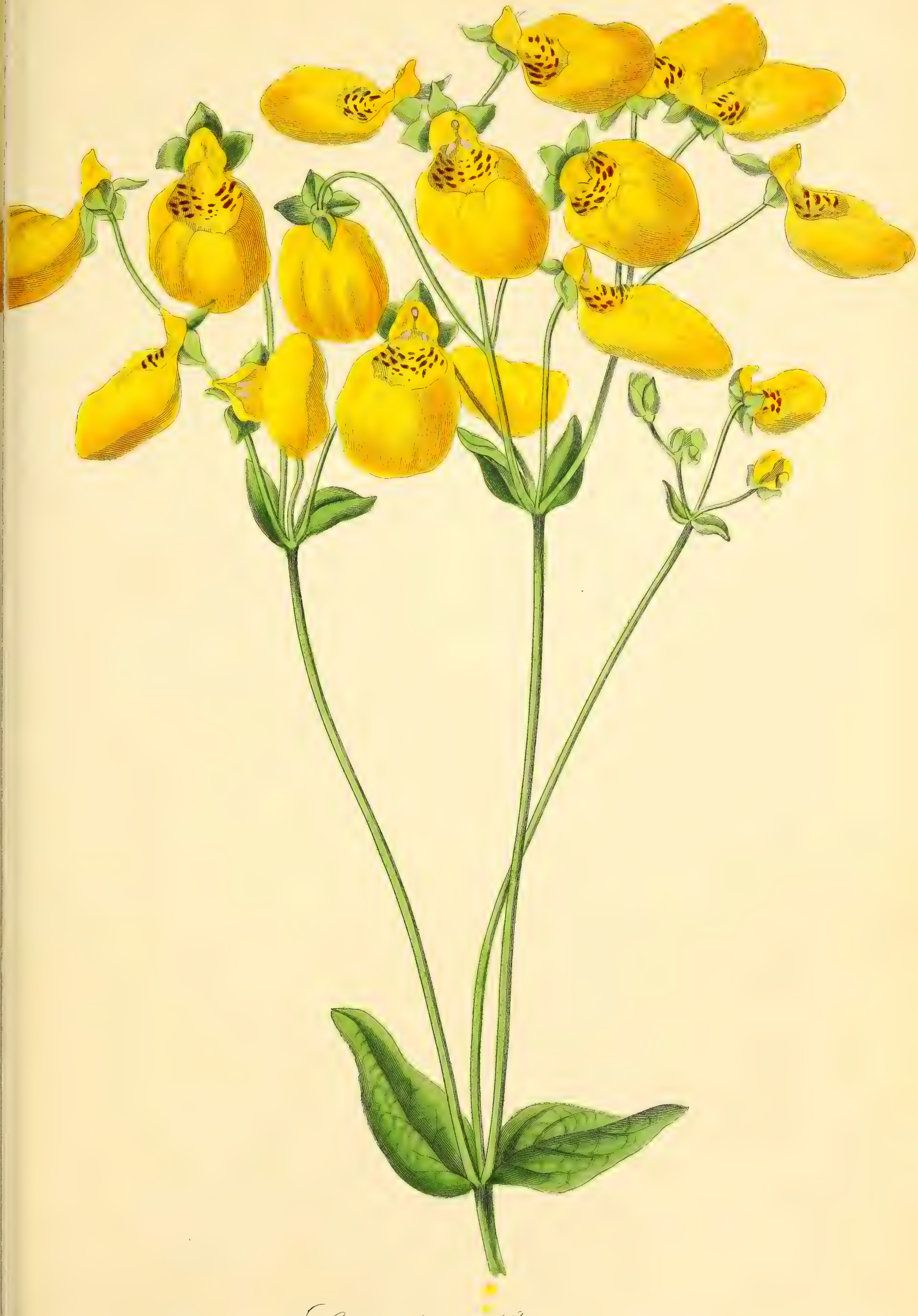
THIS beautiful hybrid was raised a few years ago, betwixt *C. corymbosa* and *C. plantaginea.* It is an exceeding free flowerer, and the colour of the flowers is of so rich a yellow that it is a very desirable plant for the green-house.

Greater part of the hybrid herbaceous kinds will bear our winters in a frame, or even without a frame, if planted on a warm border, where they are sheltered from excessive rains and severe frost. In most situations, this can be easily done with hoops and mats, or by placing an inverted flower pot over each, or covering them with hand-glasses; of these, the last is far the best: the two first plans shut out the light and air from the plants, the latter may be propped up all round for air, and the plants will also receive uninterrupted light through the glass.

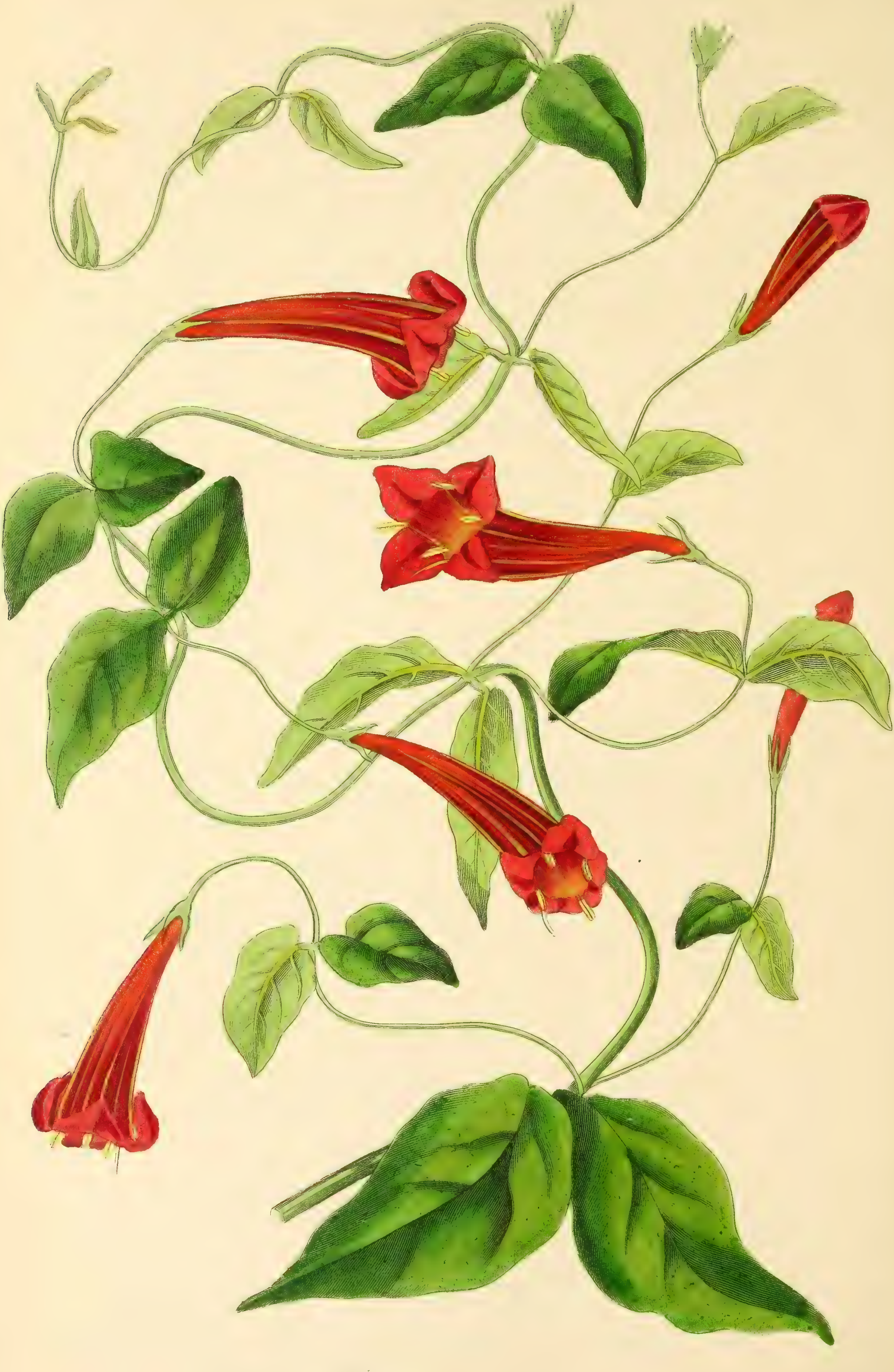
This plant thrives best, if a good portion of heath mould (sandy peat) be added to the soil in which it is grown.

It is cultivated readily by division of the roots, but occasionally by cuttings and seeds, the best season for separating the roots is immediately after they have done flowering, which will be about August. Plant the divisions in small pots, and place them in a frame, with a gentle warmth, and they will soon make fine plants. The cuttings are also best planted in August; place the pots containing them in a gentle heat, and cover the cuttings with a bell or hand-glass. For general culture see vol. 1, page 246.

The plant from which our drawing was made flowered in the greenhouse at Chatsworth, early in August, and continued in bloom until the end of October.



Calceolaria Hopeana.



F. W. Smith, del et sc.

Manettia cordifolia.

MANETTIA CORDIFOLIA.

(HEART-LEAVED MANETTIA.)

CLASS. TETRANDRIA.

ORDER. MONOGYNIA.

NATURAL ORDER. RUBIACEÆ.

GENERIC CHARACTER.—*Calyx* four-parted, with a small tooth in each division. *Corolla* tubulose, quadrifid. *Stamens* four, inserted in the tube. *Capsule* two-celled. *Seeds* flat, with a membranous border, or winged.

SPECIFIC CHARACTER.—*Plant* shrubby. *Stems* smooth, slender, twining, tinged with purple, rising to twelve or twenty feet high. *Leaves* opposite, shining, waved, two inches long, and an inch and a half broad towards the base; but tapering to a rather blunt point at the extremity, somewhat heart-shaped, with purple veins. *Leaf-stalks* an inch or more long on the lower leaves, but shorter on the upper ones. *Flowers* solitary, axillary; and also terminating the branches. *Flower-stalks* slender, two inches long. *Calyx* with four sharp-pointed ovate segments, having a tooth inserted in each cleft of the calyx. *Corolla* bright scarlet, nearly two inches long, very handsome, smooth and shining outside, hairy towards the base of the tube in the inside; form of the tube somewhat triangular.

SYNONYM—Manettia glabra. *D. Don, in Brit. Fl. Gard.*, 233.

THIS elegant plant is a native of the woods of Buenos Ayres, where it was discovered by Mr. Tweedie, who sent seeds of it to Dr. Neill of Cannonmills, near Edinburgh, in whose celebrated collection of plants it flowered for the first time in 1832; and has since rapidly increased, being now found in almost every part of this country.

Our plants evidently thrive best planted in a mixture of heath mould (sandy peat) loam, and well rotted dung. The culture is remarkably easy and simple, the plants merely requiring to be potted as often as the roots begin to mat, and kept regularly in the green-house.

The mode of propagation is by cuttings, which should be made of the half-ripened wood, and be planted in pots of sand, and plunged in a gentle moist heat; and in a fortnight or three weeks they will have struck root; and in six weeks will require to be potted off.

In summer, the plants may be turned into the borders in warm situations, but they will not endure bad weather, and are therefore of short duration;—it is best to keep them in the green-house.

For the figure of this beautiful plant, we are indebted to Mrs. Lawrence, in whose collection it was in flower beautifully in September last.

The generic name was given by Linnæus, in honour of Xavier Manetti, Professor of Botany at Florence; and the specific name from the form of the leaves by Martius.

MAXILLARIA DEPPEI.

(MR. DEPPE'S MAXILLARIA.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

Generic Character.—Vol. II., page 196.

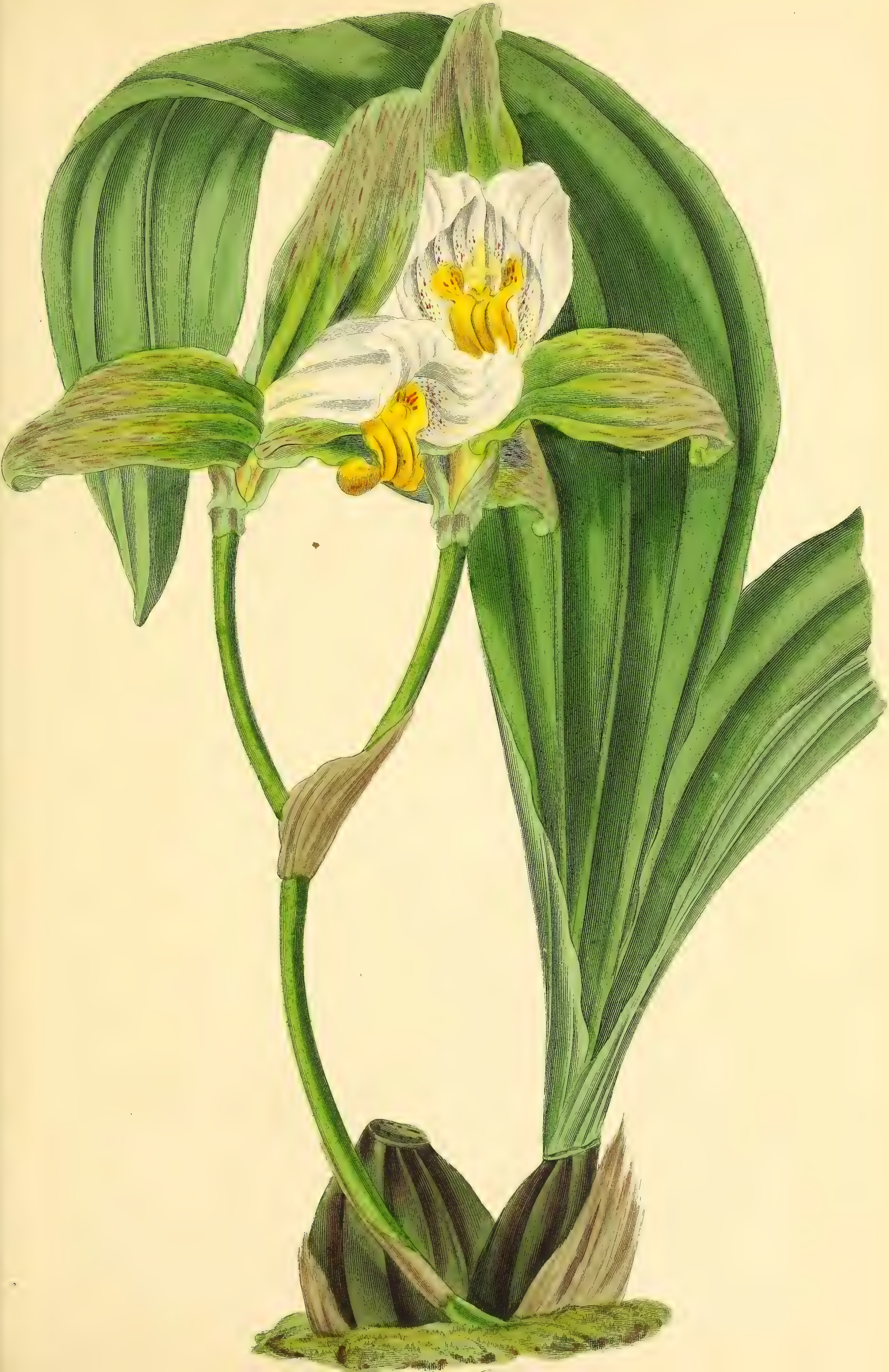
Specific Character.—Epiphyte. *Pseudo-bulb*, ovate, angles rounded. *Leaves* oblong-lanceolate, acute, platted or ribbed, usually three arising from the summit of the pseudo-bulb, from eighteen inches to two feet long. *Flower stem* erect, shorter than the leaves, two-flowered. *Sepals* oblong-lanceolate, green, spotted with purplish red. *Petals* white, smaller than the sepals, somewhat cucullate, spotted and striped inside with crimson. *Labellum* or lip three-lobed, curling, bright orange, two side lobes, spotted and striped with crimson. *Column* cream-coloured.

This fine species is a native of New Spain, where it was discovered by Mr. Deppe, after whom it has been very properly named. Messrs. Loddiges received it from Mr. Deppe in 1828, and it flowered in the stove of those gentlemen in June, 1830, when a drawing was taken and appeared in the Botanical Cabinet, page 1612.

We possess some plants of this species in our collection at Chatsworth, one of which flowered very finely a short time ago, but for our present figure we are indebted to the kindness of Messrs. Loddiges, who allowed our artist to draw it in August last.

The plant requires the constant heat of the stove, and should be potted in turfy peat (heath mould), piled up six inches above the rim of the pot, after the manner of *Stanhopea insignis, &c.*, as recommended page 141. Indeed, the greater part if not all the epiphyte species thrive best potted on this system, which, when nicely done, has a neat but novel appearance. We have adopted the system generally at Chatsworth, and find it answer our highest expectations, but more of this in a future number.

It is propagated by separation at the roots, like other *Maxillarias;* but, previous to separating, the plant ought to be allowed to become dry for a few days.



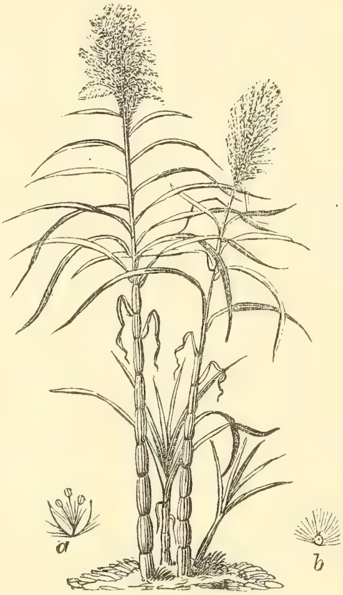
HISTORY AND CULTURE OF THE SUGAR CANE,

(SACCHARUM OFFICINARUM.)

THIS grass or reed, though unknown to the ancients, has become of immense importance in modern times. There are many varieties or species, both wild and uncultivated, natives of the banks of rivers and meadows in both the Indies, China, Africa, the South Sea islands, and South America.

It is cultivated in a zone extending from 35 to 40 degrees on each side of the equator. Where it was first cultivated is unknown: in all probability, in India; for the Venetians imported it from thence by the Red Sea, prior to 1148. It is supposed to have been introduced into the islands of Sicily, Crete, Rhodes, and Cyprus by the Saracens, as abundance of sugar was made in these islands previously to the discovery of the West Indies in 1492 by the Spaniards; and to Madeira by the Portuguese, and hence to the West India islands, and the Brazils.

The Dutch began to make sugar in the island of St. Thomas, under the line, in 1610; and the English in Barbadoes, in 1643, and in Jamaica in 1644. The culture of the cane has since become general in warm climates, and the use of sugar being universal, it forms one of the first articles of commerce throughout the world. It was in use in England in 1466, but chiefly in feasts and as a medicine, till it was brought from the Brazils about 1580 to Portugal, and imported from thence.



The cane, as a stove plant, is of easy culture, in a rich loamy soil, in a good heat and kept rather moist. It was grown in abundance in the stoves of the Paris Gardens, and a small sugar-loaf was made from the canes, and presented to the Empress Josephine. In the botanic gardens of Toulon and Naples it stands the winter in the open air.

The cane in the West Indies is propagated by cuttings from the root end, planted in hills or trenches in spring or autumn, something in the manner of hops. The cuttings root at the joints under ground, and from those above send up shoots, which in eight, twelve, or fourteen months, are from six to ten feet long, and fit to cut down for the mill. A plantation lasts from six to ten years.

Sugar mills are merely iron rollers placed vertically or horizontally, between which the canes are passed and repassed. The juice thus squeezed out, is collected and boiled with quick-lime; which being an alkali, imbibes the superfluous acid, which would otherwise impede crystallization. Impurities are skimmed off, and the boiling is continued till a thick syrup is produced, when the whole is cooled and granulated in shallow vessels. It is now the raw or Muscovado sugar of commerce. A further purification is effected by dissolving it in water, boiling, skimming, adding lime, and clarifying from the oily or mucilaginous parts, by adding blood or eggs, which incorporate with them and form a scum.

When boiled to a proper consistency, it is put into unglazed earthen vessels of a conical shape, with a hole at the top, but placed in an inverted position, and the base, after the sugar is poured in, covered with clay. When thus drained of its impurities, it is taken out of the mould, wrapped in paper, and dried or baked in a close oven. It is now the loaf-sugar of the shops.*

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* Encyclopedia of Plants, p. 74.

OPERATIONS IN THE FLOWER GARDEN FOR JANUARY.

Anemones planted now will flower in the beginning of June. Page 17.

Alströmerias about the end will require to be re-potted previous to their beginning to grow. They all thrive well in a mixture of about equal parts of rich loam, sand, and leaf-mould. Vol. I. page 199.

Anomatheca cruenta should be re-potted in this month, and the offsets separated; water them very carefully till they begin to grow. Vol. I. page 103.

Azaleas brought into the forcing-house last October will now be in flower, and must have a good supply of water. Vol. I. page 126.

Bouvardia triphylla treated as recommended vol. I, page 225, will now make a fine show in the green-house or conservatory.

Bulbs of various kinds in pots for forcing should now be introduced successively into heat to bring them into flower. Vol. I. page 41. Vol. II. page 8.

Cyclamen persicum must now be very carefully watered, and have abundance of air. Vol. I. page 180.

Ericas. If the weather be very dull, dry up the dampness of the house with occasional firing; be also very sparing of water, except the weather be very fine.

Forcing. Continue to take in lilacs in pots, pinks, carnations, &c., &c.

Orchideæ. These curious plants should now have little or no water, and the temperature should never exceed 65 degrees by day, or come below 55 degrees by night. Page 125.

Plants in rooms must be placed in as light situations as possible, be allowed plenty of air when the weather is fine, and receive but little water. Vol. I. page 39.

All kinds of Cape Bulbs now growing must still remain in a pit or frame, and be preserved from frosts and heavy rains, and be watered rather freely in fine weather. Vol. I. page 8.

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